

THE CULTIVATOR.

TO IMPROVE THE SOIL AND THE MIND.

NEW SERIES.

ALBANY, JANUARY, 1851.

VOL. VIII.

Progress of Agriculture.

Improvement in Agricultural Implements.

IN view of the great attention which has of late years been devoted to agriculture, the question is sometimes asked—What have we gained? The inquiry is a proper one, and deserves serious consideration; for if all the expense of labor, time and money, which has been spent in attempting improvement has failed, in reference to that end, it is time to pause in our career, and either abandon the object of pursuit, or seek to obtain it by some more practicable means. If, on the other hand, our efforts have been in any degree successful, it is important to know wherein, and at what cost. We should take a careful retrospect of our journey, endeavor to measure our progress with accuracy, and place such landmarks at the different stages, as will serve as guides to those who may come after us.

We propose to notice in this and succeeding numbers, some of the improvements in agriculture which have been introduced in this country within the observation of many who are still engaged in that branch of industry. We here use the term improvement in an economical sense, our design being chiefly to show wherein ingenuity and skill, as applied to the cultivation of the earth, have been made conducive to a better return for labor.

Various important points have been gained in the different branches of husbandry, though it is in the implement department that improvement has been most conspicuous, and it is to this source that we are in a great measure indebted for our improved modes of tillage.

THE PLOW may be regarded as forming in part, the basis of agriculture, and for this reason it is proper to consider, in the first place, the improvements of this implement. We cannot here specify all the changes which the plow has undergone from the earliest ages. A comparison of the figures representing the plow used by the ancient Egyptians, or Romans, with those in use among the most civilised nations at the present day, shows a striking contrast; though there are instances, as with the Moors of Africa, and the Spanish settlements of America,

in which but little advance has been made from the most primitive rudeness of the implement. It is, however, chiefly within the present century, that the most important improvements in the plow have been made. The substitution of cast-iron for the wooden mould-board was made in Scotland towards the close of the last century, and about that time considerable discussion began in Great Britain in regard to the proper construction of the plow. This discussion was subsequently extended to this country, and the improvement of the plow became a prominent object with our agricultural societies. Still it was several years before any material advance became perceptible, and it may be safely assumed that the most valuable improvements have been added to the implement within the last forty years, and the greater portion of them within much less time.

The results of the modern improvements in the plow, may be comprised under the following heads:

1. Greater ease of draft. This item alone has lessened the expense of plowing in many instances fully one half. Formerly, it was common in "breaking up" or plowing sward, to use four oxen or horses, with sometimes an extra horse as a leader; the manual force being a plowman, a driver, and, if the land was at all stony or hard, a hand to bear on the plow in particular places. Lands in the same condition are now plowed with two oxen or horses, with only one man, who is both plowman and driver, more land being plowed in a day, and at a greater average depth, than before. This ease of draft is owing partly to the wearing surfaces of the plow being hard and entirely smooth, and partly to the form being more nearly that which is calculated to accomplish the work with the least resistance.

2. Superior execution of the work. A great gain has been effected in this respect. The better condition in which the soil is left by the improved plow, saves much of the expense of after cultivation, and insures a much larger return in the crop. In the culture of Indian corn and other hoed crops, the amount of hand labor is reduced at least twenty per cent. There is less grass to be subdued by the hoe, while at the same time the vegetable and earthy matters of the soil are brought into the state from which the crop derives the most support.

3. Adaptation to special purposes. Something has been gained in this respect. It has been discovered, for instance, that soils which are too light, should be plowed in a different manner from those which are too heavy; that rough and uneven lands require a different plow from those which are smooth and level; and some attention has been given to the manufacture of implements best fitted to accomplish the various objects desired. This is an important point, and the encouraging results which have already been attained, should stimulate to further exertions in this direction.

4. Cheapness and durability. It is a gratifying and somewhat remarkable fact, that in addition to all the above advantages which the improvement of the plow has secured, the implement is afforded at about half the cost, and is also much more durable.

THE SHOVEL.—This implement has undergone almost an entire change within the recollection of living witnesses. The shovels first used by some of our oldest farmers were entirely of wood. They were made by working down a thick plank, commonly of maple, till it assumed as near as possible, the requisite form. Sometimes a thin and narrow strip of iron was nailed close to the edge, to keep it from being split. To use these shovels the earth had first to be thoroughly loosened by the crow-bar and pick, and even then, it was not uncommon for one man to use a hoe for the purpose of loading a shovel used by another.

This wooden shovel after a while, gave place to an iron-shod one. This differed from the first mentioned only in having a plate of iron, about three inches wide fastened to the edge. In some of the best of this kind, the iron was grooved, and the blade of the shovel inserted into the groove. This was deemed a great improvement, and when shoveling was to be done, the laborer deemed himself fortunate if he could be allowed an iron-shod shovel.

The next improvement consisted in substituting sheet iron for the plate or body of the shovel. The iron was turned at the sides and top, so as to form a rim. A round socket was made near the top, into which a straight stick was driven for a handle. In other respects the plate was entirely flat, and in shape bore little resemblance to the shovel now in use. It was, however, thought to be a great advance on the former kinds. Still it was but a clumsy and inefficient tool, compared with the highly finished shovel now made. The blade was soft, and it had so little substance, that in attempting to force it into the earth, it soon became so bent and twisted as to be useless.

It may be safely said that a man can, with the same expenditure of strength, perform twice as much work in the same time, with one of our best modern shovels, as he could with either of the kinds before described. This important improvement has been

effected mostly within the last forty years, and it is not too much to say that the credit of it belongs principally to a distinguished manufacturer of Massachusetts, whose shovels and spades, for utility and value, are unrivalled in the markets of the world. This is, in fact, so generally acknowledged, that the stamp of "O. AMES" is everywhere regarded as a sufficient guaranty of the quality of the article.

HAY AND MANURE FORKS.—A great improvement has taken place in these tools. Until within a few years, they were made very heavy and unwieldy. The tines were iron, untempered, and to give them the requisite strength, it was necessary that they should be large. This not only exhausted the strength of the laborer in carrying useless weight, but prevented the easy working of the implement. Notwithstanding their size and weight, they soon got sprung out of shape. Manure forks were made of rods three-fourths of an inch thick, and they would only answer for the coarsest and most fibrous manures.

The neat steel-tempered forks now made by PARTRIDGE and others, though of not more than half the weight of those in former use, are much stronger, and a man will accomplish much more in a day with them and with less fatigue, than with the old kind. The manure forks are made with such nicety that they are used instead of the shovel to a great extent, as work can be done with the fork with greater ease and despatch.

THE AX has been the most important implement in effecting the first great change in the appearance of the country.

"With the pioneer ax what a conquest is made;
What a field from the forest is won!
What regions, reduced from the wilderness shade,
Are now warmed in the beams of the sun!"

This implement has been greatly improved. No "chopper" who has ever used a "Simmons" or a "Collins" ax, would willingly go back to the ill-shaped things in use fifty years ago. There is also a great advantage in the modern implement on the score of efficiency and cheapness. It is a maxim that "necessity is the parent of invention;" and the great use required of the ax in this country, may have been the chief cause of its improvement; at any rate we believe it may be said that the "American ax" has reached a perfection unknown in the old world.

HIGH FARMING.—A correspondent of the *Ohio Cultivator* states that at the last exhibition of the Stark county Agricultural Society, the following account the produce of 7½ acres of land, owned and worked by Wm. Pinn, a "citizen of color," two miles from Massillon, and certified to by J. J. Hoffman and Samuel Pease, Esqs., was presented to the Board:

46 bushels dried sweet corn, worth \$4.50.....	\$207 00
16 bushels common [sweet] corn, \$3.50.....	56 00
483 doz. brooms, or corn for that number, 62½.....	301 88
150 bushels broom corn seed, 20c. per bu.....	30 00
36 bushels corn, 25c.....	9 00
20 bushels apples, 26c.....	5 00
Fodder estimated worth.....	12 00

\$620 88

Practical Husbandry.

Market Gardening and High Farming.

EDITORS OF THE CULTIVATOR—I have been taking a look at the market gardening and other modes of cultivating the soil in the vicinity of the city of Boston. The amount and profit per acre obtained by the systems of culture there practiced, is truly surprising.

I first visited the grounds of GEORGE PIERCE, Esq., in West Cambridge. He cultivates twenty-six acres of land, all told. At the time of his purchase, his land was a light sandy loam, in a worn out condition, and would have been called the poorest kind of 'plain land.' He has spared no pains to redeem it from sterility. Manure has been largely purchased at the city stables, costing \$7 per cord, when delivered on the farm. His whole annual purchase of manure amounts to from \$800 to \$1000. In applying it to the soil, the principal rule observed is, to put on all that can possibly do good.

Mr. PIERCE considers that a light warm sandy loam is the most favorable soil for market gardening; and that although at first it may be comparatively unproductive, yet, when made fat by high cultivation, the crops are sure, and the land is more easily worked than heavier loam.

Seven acres are principally devoted to the raising of fruit. In the apple orchard, the trees stand thirty-six feet apart, each way. As they are now mostly large trees, the ground is pretty much given up to them. A moderate coat of manure is spread over the surface each spring and plowed in, without particular reference to the roots of the trees, but with special care to prevent the barking of their trunks. All weeds are kept down, that the trees may have full possession of the soil. The apples are in consequence large and fair, the product is large, and the fruit brings top prices in the market. While the trees were young and growing, heavier dressings of manure were applied to the ground, and the open spaces between the rows were occupied by vegetables for the market. By means of this constant working of the land, the trees begin to bear some fruit in six years from the time they are set out; and in thirteen to fifteen years, they will produce, in favourable seasons, an average yield of five barrels per tree. From four trees of the Porter apple, Mr. Pierce last year sold twenty-four barrels of apples, so large, smooth and fair as to command five dollars per barrel. Mr. Pierce is particular in so training the branches of his young trees as to prevent them from shading or otherwise interfering with each other; and the branches are encouraged to start out low on the trunk, to protect its sap from too high heat by the rays of the sun.

Four years ago, an apple orchard was planted out,

embracing four acres, the trees standing in rows thirty six feet apart, each way. At the same time, about 1000 peach trees were planted between the rows of apple trees, twelve feet apart each way. The land, for several years previous, had been devoted to market vegetables, under high cultivation. The growth of trees is very remarkable; and the peach trees are now bearing finely. Being short lived, they will soon be out of the way of the apple trees; and then, for a few years, vegetables will be grown in the open spaces.

Nineteen acres are devoted to the raising of vegetables for the Boston market. As before intimated, this land is highly manured; it is also deeply worked, as deep as the plows can be made to run. A great variety of vegetables is here raised, in order seasonably to supply the successive requirements of the market. For several weeks, in the height of the producing season, two and three wagon loads are daily sent to market, embracing twelve to fifteen varieties of vegetables.

It is a leading and principal idea with Mr. PIERCE, so to adapt different vegetables to the land and to each other, as to obtain at least two, and often four crops in a season, from one and the same piece of ground. For instance: on one plat of land, early radishes are sown broadcast, and early peas are sown in double drills, say five feet apart; at the proper time, either squashes, melons, or cucumbers are planted between the rows of peas: the radishes get out of the way of the peas, and the peas get out of the way of the vines; and thus three crops are successively matured. Enough manure is put on to the ground in the spring to afford full sustenance to all the crops. On other ground, early potatoes are raised, and marketed in season to sow turneps and obtain a full crop. Or perhaps after the potatoes the land will be sown in August to onions. In the fall they are covered with swamp hay or other litter; they remain in the ground through the winter without injury; in May following they are ready for market, and in June the land is ready for any other crop. Or perhaps after the potatoes, spinage is sown for greens, and the next spring the land is clear.

It is also a leading idea to get all kinds of vegetables into the market at the earliest possible period; for any article, appearing there a week or two before its usual time, commands a very high price, which richly rewards any extra labor or pains. Mr. Pierce has extensive hot beds for forwarding his various productions for an early market. He has 250 sashes, or some 1400 surface feet of glass, under which all sorts of vegetables are started. Last spring he went largely into the production under glass of early dandelions for greens. The receipts from this source, in March and early April, amounted to \$3 per sash, or one shilling per surface foot of ground.

Tomatoes are sown under glass; and as it is important in early spring to economise the room in the hot beds, they are first transplanted from the seed bed to a vacant space in the hot bed, six inches apart, and when too large to stand so closely, they are again transplanted twelve inches apart, and when the weather is right, they are taken up and placed in the open plat where they are to mature. At one picking of tomatoes, this season, 32 bushels were obtained, which, from their earliness, sold at \$1.75 per bushel. Pole beans are produced early by digging large deep holes for the hills and filling them partly with fresh hot horse manure; over that a suitable covering of earth is placed, and the beans are planted. For all *early* vegetables the ground is stoutly dressed with hot horse manure, which is plowed in, and which, by its fermentation, keeps the land warm and mellow, and brings the plants along very fast. Early potatoes are first started either on manure heaps undergoing fermentation, or in hot beds; and when the weather will admit, and the sprouts are six to eight inches long, they are carefully taken up by hand and transplanted in the drills in the open plats. This process forwards the crop from fifteen to twenty days. On one quarter of an acre, managed in this way, this season, 81 bushels of marketable potatoes were dug, which, for their earliness, sold at \$1.75 per bushel, or at the rate of \$567, per acre.

In visiting Mr. Pierce's grounds, I was most interested in a field on the borders of Spy Pond. Originally a high bank, shut down nearly to the water. This bank was dug away and tipped into the pond, until a long strip, or three acres of land was made, which was raised eighteen inches above the surface of the water. The earth taken to make this land, was a sandy and fine gravelly subsoil, with the exception of two or three inches of the top, which was surface mould, placed there to form an immediately tillable soil. The waters of the pond will come into and stand in a hole dug any where on this land, more than eighteen inches deep; and the moist exhalations from below keep the surface so moderately moistened, that the growing crops do not suffer in the driest seasons. The land being of a sandy and fine gravelly nature, it admits of much moisture without becoming cold, heavy or baked; and as it has been abundantly enriched with manure, it produces the finest of vegetables when, perhaps, other fields are suffering severely with drouth. The crops are grown upon ridges or beds, formed by back furrowing with the plow, and varying from two to six feet in width. This is done to prevent any bad effects that might otherwise arise from heavy rains, falling upon a flat surface, already moist enough. In general, three crops are taken from this land, each year. For instance, on the wide beds, a row of early beets grows on each border; a row of hills of sum-

mer squash in the centre, and celery in the dead furrows. The beets are first off, and then the squashes, and the soil composing the beds is used in earthing up and bleaching the celery. Mr. PIERCE's average *weekly* sales of *vegetables* for nine months, in 1849, were as follows:

In March,.....	\$49 00
April,.....	50 00
May,.....	80 00
June,.....	90 00
July,.....	140 00
August,.....	139 00
September,.....	140 00
October,.....	150 00
November,.....	39 00

The total cash receipts for the sale of fruits and vegetables, for 1849, were as follows:

Of Peaches,.....	\$591 60
Porter Apples,.....	148 60
Bartlett Pears,.....	18 12
Bell do.....	4 75
Greening Apples,.....	12 50
Baldwin do (windfalls),.....	36 00
39 bbls do picked,.....	155 50
	\$997 07
Total vegetables of all kinds,.....	2,629 72
	\$3,626 79

These are certainly large receipts to derive from the products of twenty-six acres of land. It is true that Mr. Pierce has the advantage of a ready market and good prices; but after making every allowance that exists, or can be thought of, I think we must all conclude that high cultivation is the true system; that

" 'Tis folly in the extreme to till
Extensive fields, and till them ill;
For more one fertile acre yields
Than the huge breadth of barren fields."

I next visited LEONARD STONE, Esq., at his farm in Watertown. Mr. STONE's home farm consists of 15 acres of woodland and pasture, 25 acres of reclaimed meadow, and 80 acres devoted to fruit, market gardening, and a rotation of field crops. The largest portion of his tillage land is a stiff, moist loam, resting on a substratum of clay; and although the surface is quite rolling, it requires a great deal of draining to fit the soil for profitable tillage. The balance of the tillage-land is a light, dry, warm loam, with some very gravelly knolls, and the whole rests upon an open gravelly subsoil.

The owner has for several years been clearing his tillage-fields of stones, which were formerly so numerous as to be much in the way of the plow. They have been sunk in the construction of drains, and thus the surface of about every acre of the stiff land has been relieved of both stones and surplus moisture. The ditches for drains are dug about three feet deep, and of convenient width to work in; in them, drains are first laid, six inches wide and ten inches high, of small cobble stones, and covered with larger sizes of the same; the ditches are then filled with small stones, to within a foot of the surface of the ground; a layer of shavings or tough sods is then put on, and the work leveled up with loose earth. The drains thus constructed have stood from eight to twelve years, and still work well.

There are two reclaimed swamps on this farm, of about twelve acres each. They are underlaid at suitable distances with stone drains, wherever there is sufficient fall to the land to produce a good draught through them; and where the land is nearly level, open ditches are made. The open drains used frequently to become inoperative by the washing and caving in of their banks—occasioned by high freshets in the spring. After various experiments, the following plan for their protection was adopted: As early in the summer as the water had fallen away so as to admit of working, a commencement was made at the lower end or outlet of the ditch, by throwing a temporary dam across it, a few rods above or up the ditch; the portion thus freed of water was then cleared out; the sides were made of a uniform and proper slant; narrow trenches were dug, four inches lower than the natural level of the bottom of the ditch; sods were cut from the swamp, six inches wide, eighteen inches long, and four inches thick; then, commencing in the narrow trench, four inches lower than the bottom of the ditch in order to prevent the undermining of the work, and following up the slanted sides with one course thick of sods, and breaking joints in the upward course the same as is done in laying brick, and laying the sods grass side down, the wall or sodding was carried up nearly to the surface of the swamp; a sufficient portion of the surface was pared down to a level with the wall to admit of a sod on top, laid grass side up, and level with the surrounding swamp, and resting on the sod wall and on the natural ground; the face of the banks was then trimmed smooth with a spade, the temporary dam moved further up the ditch, and so on, till the whole line was completed. The grass immediately started from the edges of the sods, and before winter, the whole surface of the banks was well covered with grass. These banks have stood perfectly for nine years.

In draining the bog meadows, a ditch has been dug three feet deep and four feet wide, the whole length of the border between the uplands and the meadows. In this a stone drain was first made, then the ditch filled with stones, and a stone wall built on top for a fence, by which three purposes have been accomplished; the stones from the uplands have found a resting place, out of the way of the operations of tillage; the springs flowing into the swamps from the uplands have been cut off; and the earth taken from the ditch is just the thing for a covering for the meadows. When the drainage is completed, those parts of the meadow that have dried off enough to bear up a team are plowed, and those that are still too wet and miry are turned over with a bog-hoe. When the surface of the meadow is frozen, clay, loam or gravel, whichever is handiest, is carted on and spread one and a half inch thick, or

at the rate of about an ox-cart load to each square rod of ground. On the top of that a good coat of compost made of loam and manure is spread, and then a half bushel each per acre of herds-grass and red-top seeds sown. After this, most of the land can be plowed; and as often as the cultivated grasses need renewing, the sod is turned over in September with the plow, manure applied on top, and grass-seed sown. Forty tons of hay have been cut in a season, on twelve acres of the reclaimed meadow.

Mr. Stone plows and manures about 25 acres of his upland, yearly. A part of this, however, is not cropped at all, but is kept open for the benefit of the trees growing thereon. The balance is devoted to the growing of vegetables for market, the raising of carrots and other roots for the stock, and the cultivation of field crops. For the land that grows vegetables, he purchases horse manure from the city stables and mixes it with compost made by the hogs, in order to start the crops early. For all other crops, the manure used is wholly made on the farm, and is applied at the rate of thirty loads, of twenty-five bushels each, per acre. Mr. Stone is in favor of deep tillage. He plows his land as deep as the soil will admit, gradually increasing the depth, until, on some of the fields, his largest sod plow, will go no deeper. He thinks that almost any land may be advantageously deepened by turning small portions at a time of the subsoil to the surface, to be converted by sun, air, frost, and manure, to productive loam. Under this system of deep plowing and high manuring, his crops are all luxuriant, and when those portions of the land devoted to a rotation of crops are laid to grass, he thinks they give him an average of two tons of hay to the acre, at a first cutting. Two hundred loads of first crop hay have been put into the barns this season, fifty of which, with the rowen crop, the corn-fodder, roots, &c., will keep his own stock, and leave the balance for market.

A good deal has been done, with excellent effect, in the admixture of the different soils upon the farm. Four horses and four oxen are kept for farm-work, and at leisure times they are employed in exchanging soils. The muck from the low meadows is drawn to the yards for compost, and from thence to the upland fields. As before remarked, the lowland meadows receive a coating of clay, loam, or fine gravelly subsoil, the latter of which is found to be the best, for it supplies in greatest quantity, those matters that give strength of stem to the cultivated grasses, and which are deficient in the peaty soils. In various places on the upland stiff soil, the underlying clay comes through to the surface, and the land retains too much moisture, in some seasons. On all such places, from one to three inches of sandy or gravelly loam are spread, with an effect upon the crops that is apparent to the observer in a moment.

So, too, on the dry, gravelly knolls, an application of two or three inches of clay from the stiff lands, changes the whole aspect of the vegetation growing there.

The most important production of the farm is fruit; the average annual yield of Baldwin and Russet apples, being about 1,000 barrels. Other varieties are raised, but these two are the principal. The old orchards are manured and plowed each year, but no crop is taken except that afforded by the trees. In younger orchards, the open space between the rows of trees are devoted to vegetables for market. The apples are carefully picked from the trees by hand, packed in barrels, and stored in a dry, airy fruit cellar under one of the barns. The farm produces a variety and abundance of other fruits, such as pears, peaches, plums, cherries, quinces, and summer and fall apples.

About ten acres are devoted to market vegetables, in all the varieties. The details of their cultivation would be a repetition of those already given in the account of Mr. Pierce's cultivation. While at Mr. STONE'S I saw a market wagon loaded, and had the curiosity to take an account of the various articles sent off. They were as follows: tomatoes, onions, beets, summer squashes, cucumbers and mangos and string beans for pickling, potatoes, green corn, pole beans, apples, peaches, and pears.

Mr. Stone has a farm of 60 acres a mile or two from home, which he rents for \$600 per annum. He remarked to me that his tenant paid his whole rent last year from the sales of the cucumbers raised on five acres—leaving the proceeds of the remaining 55 acres at his own disposal.

Mr. S. keeps about 20 head of cattle and horses, and from 40 to 60 hogs. Shoats, weighing from 100 to 120 lbs. each, are purchased at Brighton market, spring and fall, fed six months, then slaughtered and taken immediately to market. At killing time, they average from 275 to 300 lbs. each, dressed. All the refuse fruits and vegetables of the farm are fed to them. A kettle or cauldron holding 600 gallons and set in an arch, is mostly filled with vegetable products, to which is added six bushels of meal, and the whole is then boiled. The contents when cooked are taken out, and to the mass is added an equal measure of *slimes*, purchased at a starch factory. These *slimes* are the best part of the washings in the process of making starch from flour. For the last six weeks, the meal is increased in order to get the hogs into a high state of fatness. The yard in which the hogs run is well supplied with muck, turf, weeds, and all sorts of refuse litter, and these materials are mingled and enriched by the swine. When not at work, the horses are stabled all, and the oxen most of the year. The other cattle of the farm are stabled most of the time in the winter, and the cows nights through the summer. Their stables are directly

over the barn cellar, into which the manure goes; suitable quantities of muck, loam, turf, &c., are frequently added to the manure, the hogs have free access, and the materials are well mixed. In these ways some 600 loads of compost, of twenty-five bushels each, are annually made.

Mr. Stone showed me a statement made by him, at the request of the Commissioner of Patents, of the whole amount of his receipts and expenditures for three years. Here it is:

Whole amount for hay sold,.....	\$4,257 00
do do pork,.....	4,552 00
Fruits, vegetables, stock, &c.,	10,025 00
	\$18,834 00
Amount paid for labor,	\$3,521 00
do grain and feed for hogs, ...	2,058 00
do shoats,	1,575 00
do manure,.....	373 00
do provisions,	260 00
do goods,	707 00
do taxes \$310, and stock, \$300, ..	619 00
do miscellaneous items,	1,025 00
	10,138 00
	\$8,696 00

I think these results quite naturally remind us that too many of our farmers, by scattering limited labor and means over unlimited acres, mostly dissipate the former, and at the same time wear out the latter; and fertility having been once sapped, the further application of the old system, becomes emphatically, a lengthening, wearisome chase after lean and scattering crops. In the older settled districts of our country, we need to commence a severe condensation in our farming,—to learn a juster adaptation of capital, labor and land to each other. Our farmers can only realise substantial profits, and maintain independence and true dignity, by good cultivation.

Scanty crops offering no cheer to labor, it becomes laggard and faint: large crops stimulate labor; it easily surmounts obstacles, burdens lighten; it becomes pleasure. F. HOLBROOK. *Brattleboro', Vt., Sept. 5, 1850.*

Agricultural Education.

EDUCATION forms and perfects the mind. It commences with the first dawn of intellectual light, and is not completed till the senses are paralysed by age or destroyed by death. The early instructions of parents, the influence of associates, the accomplishment of labor, and the observations and experiences of daily life, all help form the individual character and educate the man. A small part of the sum total of education is derived from books—it is received from all sources where the senses communicate.

A GOOD EDUCATION, is that amount of knowledge in kind and quantity, that fits an individual for his situation and pursuit in life, and to discharge aright the duties that the Almighty imposes upon him. Although the education of all commences alike and for a few years is the same, yet different vocations require a different direction of the mental powers

Hence the clergyman, physician and lawyer, after pursuing their classical studies together, take widely different courses as each fits himself for his particular occupation. The merchant, mechanic and farmer are school-boys alike, but when books are laid aside, the first engages in learning the mysteries of trade; the second educates his mind to contrive and plan his work at the same time that he educates his hands to perform that work skillfully, and the other goes to

"Work, work, work,
From morning until night,"

his severe physical labor unfitting him for mental exertion; the mind in some degree becomes inactive, and consequently he is not in much danger of progressing beyond the knowledge of his fathers. In regard to *book knowledge*, the notion that was formerly almost universal, prevails to a great extent now, that the farmer and mechanic required but very little. To read, write and cypher with facility—but few, however, acquired as much as this—was considered enough for all practical purposes, though if the scholar was "quick to learn," it was well enough to know something of geography, grammar and history. When *too old* to go to school, (which happens just about the time he is old enough to be of service on the farm,) books must be laid aside so as not to interfere with labor. No wonder that in years past there has been such a *rush* into the professions by those who loved study, and into mercantile and mechanical pursuits by those who loved excitement. The drudgery of the farm could not be endured to the extent that might have been thought desirable, although opportunities to "go a fishing" and the freedom of "Independence" and "Training" days, operated as a kind of safety-valve to relieve the pressure incident to a monotonous life.

Farmers as a class are *not* educated. They do not study like the professional man, to prepare themselves for their vocation and to become acquainted with all its details. Surrounded by Nature in all its sublime manifestations, every year they witness the rise, progress and decay of vegetation; they see leaf and flower expand, seed and fruit grow and mature; they walk the earth and breathe the air, profoundly ignorant of the laws that govern the vegetable world; of the process of vegetable life in the production of leaf, flower and fruit; of the elements and composition of the earth and air; of the relation subsisting between the mineral, vegetable and animal kingdoms, and of the changes that are constantly taking place in them. Almost all agricultural knowledge has been gained by practical experiment, which is a slow and tedious process, and influenced by so many controlling circumstances that it is seldom to be relied on as absolutely correct. Not of the shepherd alone is the language applicable,

"The little knowledge he had gained,
Was all from simple nature drained."

We have just entered on the threshold of agricultural knowledge. Before us is a broad expanse, vast and limitless, all unexplored, and like the Israelites on the borders of Canaan, we see the promised land but are afraid to enter. We do not feel able "to go up and possess it." In view of the sciences that relate to agriculture, the immensity and the nature of the knowledge which they contain, we are almost led to say with the Psalmist, "Such knowledge is too wonderful for me; it is high, I cannot attain unto it."

The early education of children is under the direction of their parents, who are naturally their teachers. As is the parent, so to some extent will be the child. He forms the same habits, adopts the same ways of thinking, has the same kind of ideas and the same opinions. If the parents are unlearned and stupid, thinking little and reasoning less, there is but little prospect of the child being otherwise. Early teachers and associates exert a powerful influence, and according to the effects of such influence will be the child's future destiny. In this sense "the boy is father of the man."

Children are inquisitive, observing and imitative. If these faculties are unrestrained they will be ever learning. They soon become acquainted with the habits and uses of domestic animals, and the methods of performing the various labors of the farm. As they grow older they learn to distinguish the different productions of the vegetable kingdom—as trees, grasses, grains and weeds—and the different kinds of each. But why is their knowledge of nature restricted to a certain amount? Why can they not learn Botany, Geology and Mineralogy as easy as Grammar, Geography and Mathematics! These sciences might be partly learned while performing the labors of the farm. But here is a difficulty—they have no teacher. Farmers have not learned such things, and they do not see the need of it, and as soon as their boys are large enough to labor they cannot afford to send them to school, especially in the busy season of the year. But if they knew their true interests they would see that they could not afford to have them ignorant.

But, as before implied, education is not confined to schools. An intelligent, scientific farmer can instruct his children so that in their education there will be a constant advancement. The lessons and illustrations can be found in their walks and labors; they can then investigate the phenomena of Nature, and if they please learn science. By examining plants they may learn their names, the class and order to which they belong; the different parts of stalk, leaf and flower; the relation each sustains to the other, and the office each performs in the economy of the whole plant. Flowers, those "perfect specimens of God's handiwork," afford a study that may be made intensely interesting, as exhibiting infinite wisdom and skill in their formation; beauty in

their color and shape, and perfection in the purposes they serve. Also, minerals may be examined and compared, their properties investigated and the proportion in which they exist in the composition of different rocks learned. It may be shown that the crumbling down of rocks and the admixture of vegetable matter, form soils, which according to the presence or absence of certain elements are rendered fertile or barren: that the elements which compose vegetable substances are derived from the soil and atmosphere, and that these support animal life and promote animal growth. In this way, by improving the means within reach, the young may be educated in the sciences that relate to agriculture, and there may be a constant progression. But some perhaps who almost consider it sacrilege to be wiser than their fathers were, may inquire, "What is the use of all this learning?" True, it may not be of much use simply to know what is quartz, feldspar, limestone, potash or soda, or to know that stamens and pistils are a part of blossoms, but it is beneficial in connection with this, to know what soils are adapted to different vegetables; what vegetables are best for the growth of animals; and what causes fertility or sterility in plants that produce fruits, as well as in soils that produce vegetables. We might retort back upon such querists, and ask them what is the use of ignorantly laboring a whole life in obedience to the thought, "What shall we eat? or, What shall we drink? or, Wherewithal shall we be clothed?" and measure our success by the amount of property we expect to leave our heirs?

"A man is known by the company he keeps," and equally as well by the paper he takes, or the book he buys. We do not expect to find an intelligent family where there are no papers or books, neither do we expect that farmer to keep up with the times, who does not read his agricultural journal. The various agricultural books and papers now published, have a wide-spread influence, and may be considered as great and efficient helps in acquiring an education, and as such, are not to be neglected.

Some of our colleges have established an agricultural department in their respective institutions, for the purpose of teaching agricultural science. This is very laudable, but it does not fully meet the wants of the people. Practice must be taught with theory, to be effective; for, though a man may understand all science, if he does not know how to labor, he would starve if the support of his physical system depended upon his own exertions. The efforts that have been made in New-York and Massachusetts to establish Agricultural Colleges, are worthy of much commendation, and will no doubt, ere long, be successful. Such schools, rightly conducted, will exert a tremendous influence over the future destiny of our country, although but few, comparatively, may avail themselves of the facilities thereby presented,

for acquiring an education. But their beneficial effects will be in a great degree owing to their reflex influence. This will be according to the success of the graduates in the communities in which they reside and labor. If they are successful in carrying out the principles they have learned, their neighbors will adopt the same measures, and pursue a like course in the management of their farms. Thus knowledge will be increased. But no doubt the instruction imparted in these schools would be much more efficient if the agricultural and scientific education of the pupil was commenced by their natural teachers at home. Having learned the rudiments of science, they would make greater proficiency on entering the schools, and when their school education was completed, they would be better prepared to pursue their studies in the book of Nature.

There is to the farmers "a good time coming," undoubtedly. They are awaking from the long, dreamy sleep of years, to a sense of their capabilities, their rights, and their proper position among men. The advantages of a good education are being appreciated; science is called to the aid of experience; better modes of husbandry are sought out and adopted, and every new discovery is leading to others no less important. Indications of good are all around. To the young, especially, who have chosen agriculture as their vocation, there are encouraging prospects ahead, such as their fathers never knew. With so many means within their reach, to acquire an education suited to their wants, it may not only be a pleasure, but it is positively a *duty* as it will be so necessary to success in life. There should be a love of knowledge, and a resolution to obtain it, and—

"In the lexicon of youth, which fate reserves
For a bright manhood, there is no such word
As FAIL."

East Weare, N. H.

W. L. EATON.

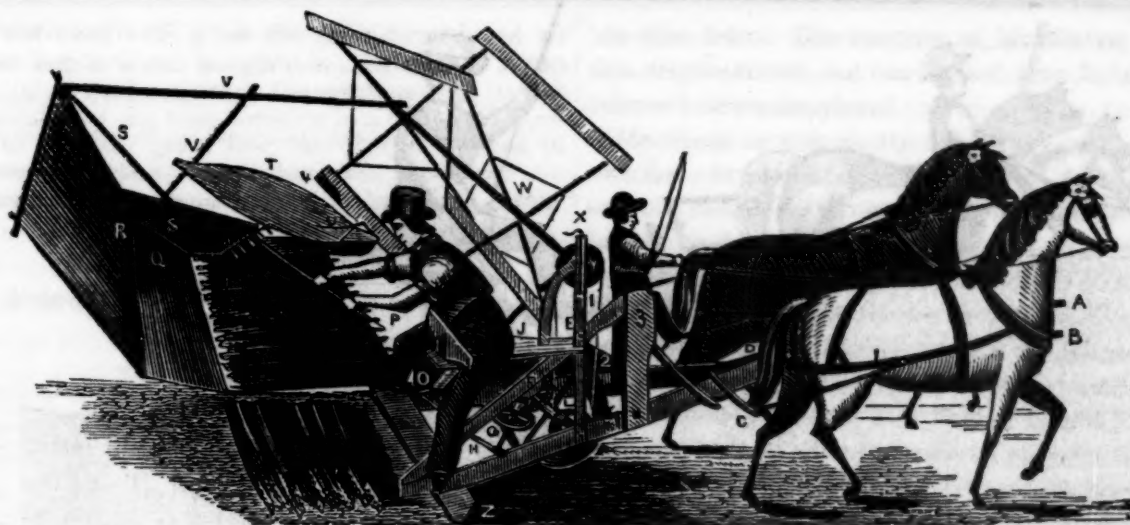
HARVESTING MACHINES.

IN our November number, we gave a letter from Mr. DENNISON, an English correspondent, making some inquiries in relation to machines used in this country for cutting grain. In answer to those inquiries, we have received several communications, furnishing much useful information. In connection with these, we give also cuts of Mr. McCORMICK's and Mr. HUSSEY's machines. Eds.

Letter from the Inventor of McCormick's Reaper.

EDITORS CULTIVATOR—I most cheerfully comply with your request, in furnishing the following "particulars respecting Reaping Machines," in answer to your London correspondent, so far as I can give the information he desires.

I have manufactured at *this place* the three last years, for use on the prairies of the west, 500, 1,500, and 1,600 of "McCormick's Patent Virginia Reapers," and am now engaged in providing a like supply of them for the next harvest. I sell my reaper for \$115 cash, or \$120, part cash and part on



M'CORMICK'S REAPER.

time. Four horses (or mules,) are required to operate the machine throughout the day, without a change, though the draft is not more than two horse power; and it is attended by a boy to drive the team, and a man to rake the grain from it into gavels of suitable size for sheaves. Six or seven men, (or "women," as the case may be,) are required to bind and shock the wheat. This is the estimated labor of harvesting wheat that stands up, and yields, say twenty to thirty bushels per acre. If the wheat be heavier, and fallen, the operation will of course be more difficult, and the speed retarded.

This reaper has uniformly been warranted to cut one and a half to two acres of wheat or other small grain per hour, (equal to fifteen or twenty acres per day;) to save at least three-fourths of the wheat that would be scattered by ordinary *cradling*; and it is also warranted to be durable. Perhaps the best evidence of the *satisfaction* given by the Reaper has been the continued large and increasing demand for it. It is constructed to cut as high or as low as required, and the *saving* of wheat by it, over that cut by the *cradle*, is estimated at not less than one bushel per acre, and in some situations more; the whole operation being more perfect than can possibly be done by hand labor in any way, and without being materially obstructed by "May-weed, thistles, dock, &c." "What will be the expense, per acre of wheat," may be calculated from the foregoing. The following is the estimated cost here, as taken from a certificate signed by some hundreds of farmers who have used this Reaper, viz:

Cost of Cradling and binding 16 acres of wheat; 8 cradlers and 8 binders, at \$1.25 each.....	\$20 00
Cost of cutting and binding 16 acres of wheat with the reaper; two men, or a man and a boy with the machine, at \$1.25 and \$1.00.....	\$2 25
Five binders, (the grain being raked into gavels,) at \$1.25.....	6 25
Use of four horses, (this number of horses in fact only nominal,).....	1 50
Total cost.....	10 00
Which deducted, shows a saving in labor of half the whole expense, being per day saved.....	\$10 00
Amounting at \$10 per day, in cutting a harvest of 240 acres, to.....	150 00
To which add one bushel of wheat per acre, saved extra, (which is the lowest estimate made,) at 40 cts per bushel,.....	96 00
Making a total saving, in a harvest of 240 acres, of.....	\$246 00
The cost of the labor per acre by this estimate, is.....	62½ cents.
From which deduct for a bushel of wheat saved,.....	40
And the actual cost is found to be, per acre,.....	22½ cents

I may add that this reaper has recently been patented in England, with a view to its immediate in-

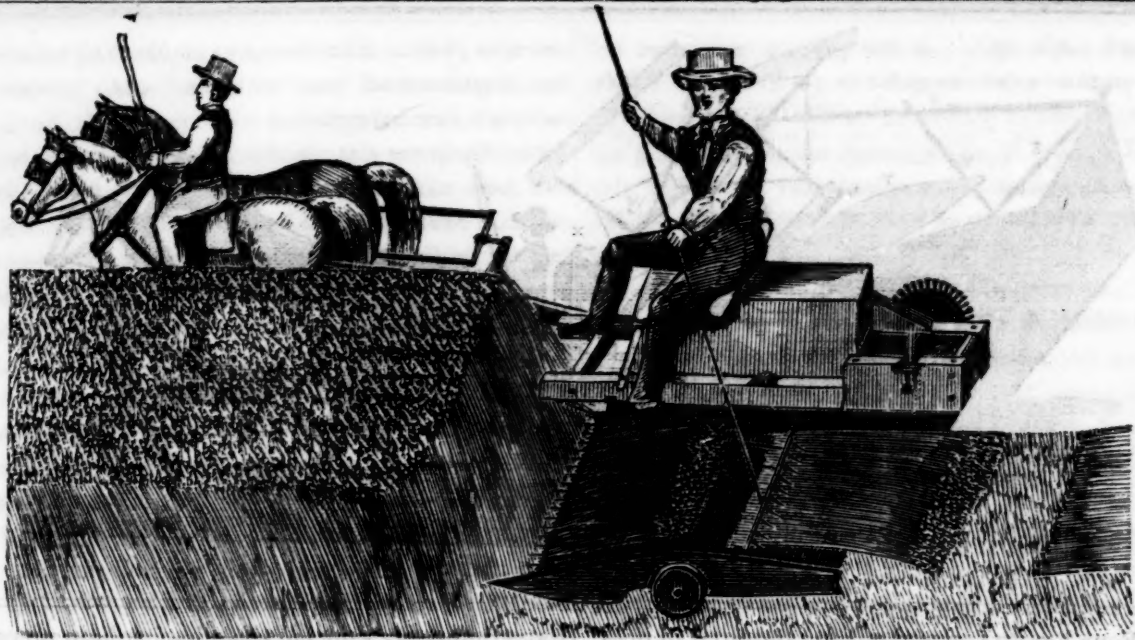
troduction there,—one of them having been prepared for exhibition at the great World's Fair, in May next, and for which the gold medal of the "American Institute" has been awarded. C. H. McCormick. *Chicago, Ill., Nov. 12th, 1850.*

Letter in reference to different Reapers.

EDS. CULTIVATOR—Four years ago, the first harvesting machine was brought into this county, and so fast did such machines come into favor with the farmers, that for the two seasons past nearly all the grain has been cut by them. Mr. McCormick, when introducing his Virginia reaper, warranted it to cut one and a half acres per hour, and save one bushel per acre more than by the ordinary mode of harvesting, or it might be returned. No machine has ever been returned to my knowledge, or any dissatisfaction expressed on account of a failure to fulfil the warrant.

This machine, as well as others, has been greatly improved, while a host of new ones are brought into the harvest-field every year. In reply to the inquiries of your London correspondent, I would say these machines are worked by horses, sometimes two being used, but more generally four. Some of the machines require the horses to go by the side of the standing grain, while the machine works on one side. The cutting apparatus of others is directly in front of the horses. Some drop the grain directly behind, which must be bound before the machine comes round again, while others drop it at one side, and the whole field may be cut before any of it is removed. Some require a man to rake the grain from them; others are constructed for self raking, and one has been brought into the field the past season that does its own binding.

The cost of these machines is from 75 to 125 dollars; the amount which they will cut per day, varies from 12 to more than 20 acres. The price charged per acre for cutting, is from 50 to 62½ cts. From seven to nine men are employed to bind and shock the grain. Women's labor is too scarce and valuable to be employed in tying grain. These machines cut all the grain, and if the raker is careful none is scattered, and if the binders carry a rake and use it, none need be lost. Fields harvested by these machines present a beautiful appearance. The stubble is uniform in height, while no prostrate, scattering straws speak of waste. If the binders have felt at all interested in doing their work well, there is nothing to glean with the sickle, bagging-hook, or rake. Weeds, brush, pitchforks, rakes, if standing



HUSSEY'S REAPER.

in the way, and even horses legs, are all cut smooth alike. Weeds make heavy raking, that is all.

Now as one man can cut from two to five acres per day with a cradle, of the grain that stands upright, and another can rake and bind it, it may be supposed that there is no great difference in the expense per acre, by hiring a machine or cutting by hand; but other considerations render the machine valuable in the estimation of farmers. First, it is supposed that it saves over and above other modes enough to pay for cutting, if not the whole expense for harvesting, and then it cuts lodged and crinkled grain readily, saving much in both labor and grain; and again, it enables us to cut our grain in season, which we could not do with the limited amount of help in the country.

There are other machines at work in the harvest-field, differing from those to which your correspondent's inquiries alluded. They take the heads of the grain only, dispensing with binding and shocking. This machine is really a labor saving machine, yet, on account of the prejudice in favor of the time-honored custom of binding grain, they are working themselves but slowly into use. Those who have tried them cannot be induced to return to the old method. The grain as it is gathered in and cut by these machines, is thrown into a canvass which carries it one side and deposits it in a wagon-box, made for the purpose, and driven by the side of the machine. From sixteen to twenty acres can be cut and put in rick in a day, by six men and eight horses. The only objection raised against this mode of harvesting, is the danger of the grains damaging in the rick; but the testimony of all who have tried it is in its favor. In a damper climate than this, it might not save well; but here, with our sunny sky and pure air, I think there is no danger. If we had your correspondent's two hundred acres of wheat here on the prairies, we would, in two weeks time, with six men and eight horses, put it all in rick for him, wasting no more than he will with all his men and his women.

We are doing more here than your correspondent or many of your readers may be aware of. Horses will soon do our haymaking as well as harvesting. For three years or more, there has been in use a harvesting machine that has been made to cut timothy and timothy and clover mixed, but not until this

year has there been any thing presented to the public that would cut our prairie grasses, some of which are the most difficult of all to cut by machinery. At the late fair of the Buel Institute held at Granville, Putnam county, two machines of different patterns were exhibited, and tested in cutting prairie grass, to the entire satisfaction of all. One of the machines clogged in some of the worst places, but the other cut its way through every thing as close or closer to the ground than a scythe, leaving the grass in a much better condition to dry. I learn that one of these last mentioned machines was used some few miles east of us, working to the entire satisfaction of its owner and all others who witnessed its operation. Both of these machines are also designed for harvesters, and both are manufactured at Ottawa, in this county. The price of the latter I understand is 75 dollars. L. L. BULLOCK. *La Salle County, Illinois, November, 1850.*

Letter in reference to Hussey's Reaper.

EDITORS CULTIVATOR—In answer to inquiry about reaping machines, page 379 of the Cultivator for 1850, I would state that I have used one of Hussey's for two years. Our wheat crop was not heavy in straw in 1849, and we cut with two horses, changing twice a day, on an average, rather over fourteen acres. This season the straw was very heavy, and I could not get over from ten to eleven acres cut per day, even using three horses at a time, and changing horses twice or oftener per day. The machine ought never to be worked with two horses, except the grain is quite light. It requires about seven men to bind after the reaper, one man to drive the team, and another to push off the sheaves from the platform of the reaper. In this way, I think wheat can be taken up as clean as in any way I am acquainted with; even the best reapers cannot do it so clean. It leaves a stubble of about seven and a-half inches in length; it can be cut lower, but then it is harder on the team. Much "May-weed" might impede the cutting somewhat, but docks and thistles would not hinder. Any grain requires to be fully ripe before it is cut with the reapers, as it is impossible for a man to push off the cut grain from the platform when cut in a raw state. It is, on the whole a wonderful labor-saving machine, as even in heavy grain, nine men may cut, bind and shock, ten acres per day. The reaper

does not work well when the grain is wet, but no farmer ought to cut his grain in that state. When grain is all laid one way, the machine will cut it beautifully by the team working in a direction opposite to that the grain lies; but if it is twisted in different directions, the machine will not work.

Hussey's reaper costs \$100 at Auburn. J. JOHNSTON. *Near Geneva, Nov. 25, 1850.*

Notes of a Tour in Central New-York.

ANALYTICAL LABORATORY, YALE COLLEGE,
New-Haven, Conn., Dec. 5, 1850.

MESSRS. EDITORS—The last days of 1850 have come, and find me still lingering in Wayne county; a district which constantly suggests fresh topics of a most interesting character. I hope however, to tear myself away before we have advanced far into 1851. At the conclusion of my last letter, I had just returned from an excursion with Mr. PARDEE, as far as the shores of Lake Ontario. A day or two afterward, I drove, with Mr. HYDE of Palmyra, a few miles south into Ontario county. One of the most interesting farms that we visited, was that of Mr. RUSH. He owns a large number of acres, and keeps a numerous stock, feeding out all of his corn, barley, oats, &c. on the premises, and only selling off the wheat. In this way he makes much manure, and keeps the land in fair condition.

The wheat crop of the present year had been so good in all this region, that very many of the farmers were carrying their corn off the land preparatory to sowing wheat. Mr. RUSH, at the time of my visit, was clearing a corn-field by placing the stacks together in rows, and had commenced harrowing in the wheat without any plowing. This was certainly a labor-saving method, but I doubt if it will afford very heavy wheat as a return. By way of illustrating the short-sighted rapacity of some farmers in this section, I mention a case of which I was told by Mr. Rush. He named a person who had shortly before cut a heavy second crop of clover from one of his fields, and had immediately gone on to plow it for wheat. It is fair to say that even on this rich land, such farming is considered *rather exhausting*. I saw in this neighborhood, an instance of the evil which results from making drains of large loose stone, imperfectly covered on the top, as such must always inevitably be. A man was at work upon a drain of this description, into which the water had broken from above, washing in so much earth that it had completely choked, and required taking up for nearly its whole length. If this drain had been covered with small stones above the large ones, such a catastrophe could scarcely by any possibility have occurred.

From Mr. RUSH's we drove through the town of Farmington to Macedon, where we passed a few moments with the well known horticulturist and author, Mr. J. J. THOMAS, walking through parts of his extensive nurseries, and looking at some of

his fine fruit. The nursery of Mr. SMITH was in this neighborhood, but our limited time forbade the call we had contemplated.

Mr. Hyde very modestly waived my visit to his own farm in favor of some others; but from what I saw and heard, he also must be included among the *improving* farmers of this section. I noticed as we passed along the road, a superb field of corn belonging to him, and quite a number of acres just brought in from swamp and wood.

The fair at Palmyra, was excellent in many respects, and the show of stock acknowledged by all to be very good. I saw some fine Devons, and some showy horses. Sampson, a Clydesdale stallion, I should judge, attracted much attention. After the list of orchards and nurseries that I have mentioned, it may easily be conceived that the show of fruit was uncommonly good.

From Palmyra, I went via Canandaigua, Geneva and Seneca Lake, to Ovid, where the fair of the Seneca county Society, was held this year. This fair was more numerously attended than any of those at which I was present. I arrived too late for the show of stock. The horses were said to have been good, but the cattle few in number, and rather inferior in quality. The exhibition of fruit did not appear so well as some that I had previously seen, perhaps because there was no place properly arranged for its reception and protection. On reaching Ovid, I found Mr. DELAFIELD, the President of the Society, at his post, as a matter of course, and exerting every energy to keep up the interest of the occasion. The name of JOHN DELAFIELD, will hereafter be associated with all the best interests, and all the progressive agricultural movements of Seneca county. If we could have but one man of such enterprise, perseverance, and sagacity, in each county of our Union, the revolution that our country would witness within the next few years would be quite surprising; the cause of improvement could not then languish as it too often has alone.

I saw the plowing at Ovid, and thought it generally very good; the Michigan subsoil plow was at work, for the purpose of showing its operation. This seems to me a truly valuable implement; the turf and grass are turned by it very completely, and the surface is left in a mould like that of a garden; at the same time it possesses the great additional advantage of plowing deeply. In a stony subsoil, or one that was very much compacted and indurated, this plow probably would not work so well as in the mellow soils where I saw it tried. A real subsoil plow of the old construction, would be the only thing for the more obdurate soils.

I may notice here as an instance of the interest which is felt by the people of this county, in any thing relating to improvement in agriculture, that on repairing to the court-house before the hour appointed for the address, I found the room already densely

packed, and a large number waiting outside utterly unable to obtain admission. It soon became evident that we must adjourn to the open air, and the address was delivered from a temporary stage erected upon the court-house steps, to a large audience, that testified by constant attention, the desire of its members to gain knowledge connected with their profession.

On the day after the fair, under the guidance of Mr. DELAFIELD, I traversed a very considerable portion of Seneca county. We first drove south from Ovid to Lodi, passing on our way thither, through numerous handsome farms, seemingly under good cultivation. Having a long circuit to make, and being obliged to reach the north end of the county by evening, we were compelled to pass many interesting farms and good farmers, without making any stop. The houses on the main road through Lodi, reminded one of New England, in their large size, their neat comfortable appearance, and the little evidences of taste as well as of thrift which appeared about many of them. From the high grounds of Lodi, may be seen both the Cayuga and Seneca lakes for a large portion of their length. The roads were all laid off at right angles at distances of a mile, and running straight across from one lake to the other.

In descending toward Seneca lake, we experienced some genuine farmer-like hospitality from Mr. WYCKOFF of Lodi Mills, and afterwards under his guidance visited the Lodi falls. These are in a deep cleft of the Moscow Shale, worn out probably by the action of water to a far greater than its original depth. The stream is insignificant, and though it falls in one place 150 feet, makes in summer but little show. The amphitheatre of cliffs however, which it has scooped out below, is some 200 feet in perpendicular height, and is magnificent beyond description; it will richly repay a visit from all who can appreciate the sublimity of such a scene. The falls can be reached in ten minutes walk from Lodi landing, where a steamer calls four or five times in each day. At one place in the face of these cliffs, native alum appears upon the surface in considerable quantities; it can be detached in pieces of medium size, and the rock from which it exudes may at some time be valuable for the purpose of alum making.

On emerging from the foot of this defile, we found ourselves on the shore of Seneca lake, and among the remains of an Indian orchard. Apple and peach trees were here in bearing, which escaped the destruction made by Sullivan's expedition against the Six Nations. Some of the apples that we picked up under these trees, were quite handsome, and showed that the Indians must have selected their fruit with some care.

From this point we commenced our journey northward again, passing through Ovid, Romulus, and

Fayette, arriving just after dark at Mr. Delafield's place, near Geneva. Much of the soil in Fayette is quite heavy for this section of the county, and decidedly wet; all that is necessary to bring it at once into a highly productive state, is the tile drain. Mr. Delafield's farm has already been described by others on various occasions, and I will therefore only say that it bears evidence of skillful management in every part. The farms of Mr. John Johnson, and of Mr. Foster, are also excellent schools for the young farmer; the latter has taken the state premium.

It is due to Seneca county to say, that I noticed fewer weeds in its fields, and along its roadsides, than in any other district that I visited; this may to some seem a trifling sign, but to me it signifies a wide-spread spirit of enterprise and improvement. The county will be fully described, its various peculiarities elucidated, and its advantages made known when the survey now in progress by Mr. Delafield for the State Society, shall be published. I will not anticipate any of its information, but will merely say that it shows a general state of agriculture that is highly creditable at present, and that is rapidly advancing toward the best standards. Yours truly, JOHN P. NORTON.

Profits of Fowls.

E. M. BRADLEY furnishes the East Bloomfield Farmers' Club with a statement in regard to the profits of eighty fowls for ninety days. In the month of February 1850, he built a poultry-house, 31 feet long and 13 feet wide, attached to a shed on one side and to a barn at one end. The roof was of boards, battened, and it had two windows for the admission of light. On the first of March he put into it eighty fowls of the common kind, mostly one year old. They cost 18½ cents each. They were fed with corn and oats, and fresh meat, boiled. Gravel, lime, and clean water were furnished constantly, and they were let out of the yard and allowed to roam every afternoon. His account of the expenditures and receipts is as follows:

Lumber and nails for building.....	\$10 90
Labor of building 4½ days, at \$1.....	4 50
Eighty fowls at 18½ cents each.....	15 00
Ten bushels corn at 50 cents.....	5 00
Nine bushels oats at 33½ cents.....	3 00
Making the whole expense.....	\$38 40

In ninety days they furnished 385 dozen and ten eggs, which at ten cents per dozen, were worth \$38,58—being a trifle more than the cost of building the house, the fowls and the grain consumed.

CROPS IN NOVA SCOTIA.—REV. H. L. OWEN, Aylesford Rectory, writes that the crops of last year were more than an average. "Wheat has succeeded well wherever sown, which has not been the case for four years. Potatoes abundant, but I fear are rotting in the cellar. Hay, a good crop, as also Rye and Barley. Turnep culture is becoming extensive, and peat soil is coming into free use."

The Horticultural Department.

CONDUCTED BY J. J. THOMAS.

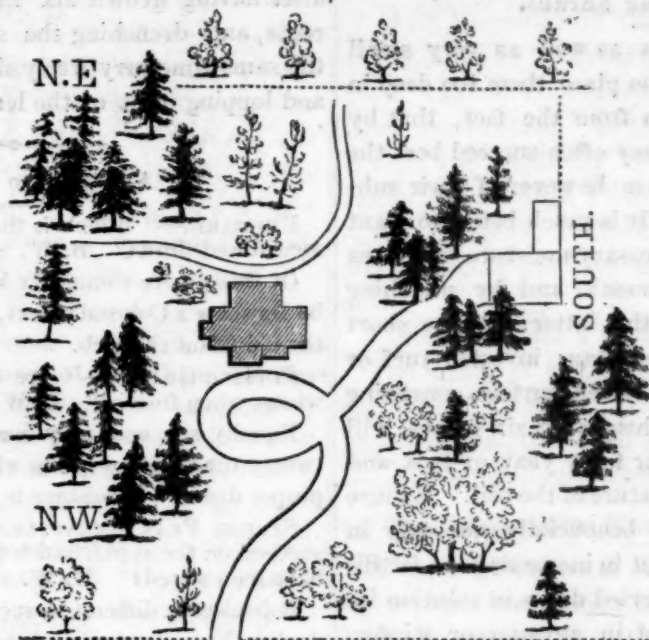
Protection from Winter Winds.

THOSE who do not appreciate the higher reasons for ornamental planting, will doubtless admit its utility, if its pecuniary economy is pointed out. A single item,—the saving of fuel,—is a sufficient reason for the protection of dwellings against the range of cold winds.

Every woodman is familiar with the contrast in apparent temperature between the center of a dense forest, and the face of an open field, during the depth of winter. In the northern states, cultivated land is often frozen to the depth of a foot; woodland soil often not half that depth under similar circumstances. Even some green-house plants will survive the coldest winters if planted under the thick boughs of a forest.

The same kind of protection may be very easily secured by the occupants of every country dwelling, by plantings of evergreens, which will serve wonderfully to mitigate the evils of our long and rigorous winters, which are so generally felt. To come at once to an estimate by bank-note consideration,—we are satisfied by considerable observation, as well as actual experience, that on many bleak situations, at least one half the fuel consumed might be saved by planting twenty-five to fifty good evergreen trees, across the sweep of the prevailing winds. It is a matter of some importance to one who values coin, whether he pays twenty-five or fifty dollars a year for cord-wood; and whether by saving twenty-five dollars a year, he may save the value of a small farm in a life-time.

And if at the same time that this positive tangible profit is secured, a tasteful and attractive appearance is given to a home,—an influence of very great importance in the moral education of a rising family,—the matter is most certainly worthy of attention. To explain more distinctly how a dwelling may be thus protected by tasteful planting, we give the above imperfect plan; more particularly as writers on ornamental planting have apparently lost sight of this important end. The prevailing winds are supposed to be from the south, north-west, and north-east. It will be observed in the plan, that the plantings of evergreen trees predominate at three points, while in



other directions the view is left more open. At the same time, art is concealed, and artificial stiffness avoided. The number of trees for these screens may be tripled if necessary.

There are few parts of the country where native evergreens of some kind may not be procured within a days journey. They may be conveyed on sleds with great ease and safety while sleighing lasts, as the large balls or cakes of earth, which all evergreens must carry on their roots for successful removal, are easily loaded on sleds, and the motion is not sufficient to jar off the soil. We have never succeeded bet-

ter with the white pine and other trees, than by cutting out a circle of unfrozen earth round each tree, under the snow, enough to preserve the tree upright, without staking, and after drawing them home, to leave them standing unplanted till spring. They varied from seven to twelve feet high when removed.

One of the most beautiful and tasteful evergreens, when grown in open ground, is the hemlock. Intermingled with

white pine, balsam fir, white spruce, red and white cedar, and other native sorts, occasionally interspersed with such exotics as the Norway, silver fir, &c., in connexion with deciduous trees properly arranged, a plantation presents an exceedingly pleasing and varied appearance.

The Seventeen Year Locust.

A copy of the recent Transactions of the Pennsylvania Horticultural Society (received through the kindness of Dr. Brinckle,) contains a paper from Margaretta Morris, and another from Prof. Goadby, on the injury sustained by the pear tree from the Cicada septendecim or seventeen year locust. It appears that these insects during their long residence below ground in the larval and pupa state, attach themselves to the roots of the tree and injure it by abstracting its sap. A special committee, under the direction of M. Morris, examined the roots of some pear and apple trees, and found great numbers of these insects passing from the larval to the pupa state. They were enclosed in separate earthen cells opening only against a portion of the root. They were then in the sixteenth year of their subterranean life. Trees thus infested by them presented usually a sickly appearance. From the roots of one pear tree nearly five hundred of these insect larvæ were

taken, in time to save the life of the tree. As it is well known that these larvæ came from the last brood of perfect insects, we are not to expect that trees planted since the last locust year will be troubled by these root-suckers. We are informed that by cutting down the tree the insects will perish for want of food. The only fact which contravenes this position, is furnished by the statements on record, of swarms of locusts rising from the ground in open fields where oak trees, their favorite places of resort, had been cut down some years previously.

Transplanting Shrubs.

IN transplanting shrubs as well as very small trees, a common error is to place them too deep in the earth. This has arisen from the fact, that by receiving more moisture, they often succeed best the first summer, at the expense however of their subsequent healthy growth. It is much better to plant shallow, imparting the necessary moisture by means of a deep, mellow soil beneath, and by mulching above. The material for the latter may be short litter, manure, moss, spent tan, inverted turf or leaves and leaf mould. A raised surface consisting of these materials, to the height of six inches, will occasion no injury whatever for a year or two, and admirably equalize the moisture of the soil. Manure used in this way, operates beneficially not only in preserving the moisture, but in increasing the fertility by the liquid manure carried down in solution by rains, especially if applied in autumn or winter. The contrast between the hard and baked surface too often witnessed when the ground is left bare, and the moist and softened earth beneath a coat of manure or litter, can be only sufficiently understood by actual experiment. Its advantages were strikingly exemplified a year or two since, in planting out a bed of strawberries in the middle of an excessively dry summer. The roots, after being fixed by water in transplanting, were protected from drouth by a coat of manure three inches thick, and although they were watered but once, not a plant perished.

Staking may be in some instances necessary to prevent swaying by the wind, or a one-sided growth where there are imperfect or unequal roots. But usually, if the shrub is furnished with good roots, and if care is taken while the earth is shovelled in, to spread them all out like the arms of an umbrella, they will serve to brace it evenly, and prevent a one-sided growth. Fixing by water, as it is termed, is often sufficient alone, to preclude the necessity of staking. It is most conveniently done by three persons, one spreading out the roots with his fingers, a second sifting in the earth, while the third settles it by pouring water from the rose of a watering-pot. Although soft at first, the soil in a few hours dries and hardens sufficiently to hold firmly the newly set roots. An additional stiffening, if needed, may

be given by encircling the stem with a small temporary mound of earth.

In transplanting roses and some other small shrubs, sufficient pruning of the top is rarely given. Climbing roses and those generally which throw up rapid and vigorous shoots will make a better growth by autumn, by cutting down to a few good buds when set out, than by leaving a long portion of stem and branches, which indeed not unfrequently draw so hard upon the roots as to cause the death of the plant. On the other hand we have seen shrubs transplanted in wet weather with entire success, after having grown six inches, by taking up full roots, and drenching the soil well with water, at the same time very freely shortening back the shoots and lopping most of the leaves.

Answers to Inquiries.

RHUBARB.—“Which is the best sort, and which the second and third?” B. W. S.

Of those more commonly known, the best appears to be Downing's Colossal; next, the Victoria; and thirdly the old Giant rhubarb.

CUTTING GRAFTS.—“Are scions just as good cut in winter when frozen?” B. W. S.

Equally so; and they may be frozen and thawed twenty times before spring without injury, provided the proper degree of moisture is preserved.

SECKEL PEAR ON APPLE.—“Does the Seckel pear succeed on the apple, and is the fruit larger in size as I have seen stated?” N. W.

It is usually difficult to succeed with the grafts or buds during the early stages of their growth, most of them commonly failing the first year or two; but those which become established grow better, and often last many years. A dwarf tree four feet high, branching from the ground, and six years from the graft, bore about one peck of beautiful fruit the past season, larger in size than common, more pyriform in shape, and not perceptibly inferior in quality.

ROOT-GRAFTING APPLE TREES.—“In planting a small nursery, will small pieces of the roots of large apple trees produce trees large enough for market sooner than the seed, and how long ought the pieces to be? Are triple buds as well as single used in budding?” J. A. D., Ravenna, O.

Cutting up the roots of large trees to graft upon has never been much practiced, and is not so certain of producing uniformly fine and thrifty trees, as the vigorous and evenly formed roots of one or two-year seedlings, neither is it so cheap nor economical of labor. But in the absence of seedlings, it may be performed on a limited scale. Younger and thriftier trees would furnish better pieces of roots than older and feebler ones. The length should be about six inches, and when set out, the soil should cover all but the tip of the graft.

Triple buds, when the center is a leaf bud, succeed well in propagating. This is nearly always the case with triple peach buds, and when cut from old or slowly growing trees, they are more likely to withstand the winter than any other. The best buds however are those strong and well formed on the large and vigorous shoots of young trees.

We cannot answer the inquiry about the gnawing of rabbits, having had no experience with them.

TRAINING DWARF PEARS.—"Is it proper where a dwarf pear seems inclined to run up too high, to cut the top off?" S. P. M.

Inquiries of this kind are often made, and we therefore subjoin a few figures by way of illustrating the mode of training dwarf pears. They are most usually trained in the form of a pyramid, as shown by figure 1; but some prefer them in the form of dwarf standards, as indicated by fig. 2.

When a pyramid is intended, a mode of pruning must be adopted quite similar in principle to that applied to the trimming of young hedges; that is, to induce a broad and sufficiently thick growth at the bottom by successively cutting back. For example, if we have a young tree of one seasons' growth from the bud, Fig. 3, about two thirds of the top should be cut off as shown by the dotted line, leaving a stump with eight to twelve buds, as in Fig. 4. During the second year, these buds throw out shoots, and form the tree represented by Fig. 5; and if, during the growth of these shoots, the upper one or leader does not keep decidedly ahead of the others, the tips of the side shoots, are to be nipped by midsummer. The same operation is repeated the second year, but at a greater height, and so on till the pyramid in Fig. 1, is formed. This is merely an outline of the work; there are several more minute details observed by skilful pruners, which may be pointed out on a future occasion.

If the young tree is left untouched, it will form a head similar to that shown by Fig. 6, resulting in the dwarf standard, Fig. 2; requiring however, in most cases, a slight shortening back, to preserve a good form.

Pyramidal training need not be confined to pears on quince; some of the finest specimens we ever saw were pyramids on pear stocks, this mode of management keeping them within limited bounds, and contributing towards their productiveness.

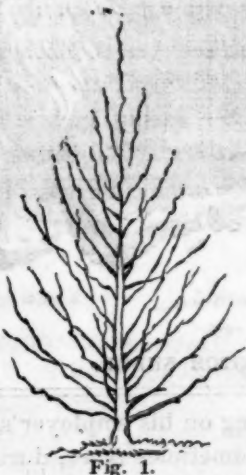


Fig. 1.



Fig. 2.

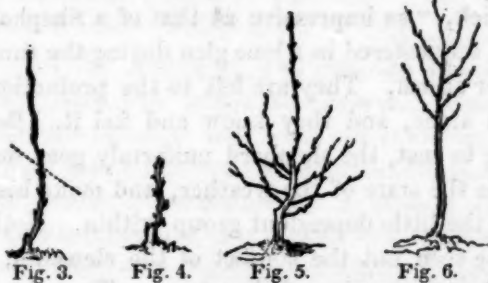


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

It may be well to add that there exists a serious difficulty in the way of the general introduction of dwarf pears. They require richer soil and higher culture than other trees, at the same time that more than nine-tenths of all trees not dwarfs generally planted by our land owners suffer greatly by neglected and deficient culture. Still more so then, would these.

Bitter and useless experience is too little for the mind, but too much for the heart.

The Spanish Chestnut.

THE heavy loam of this neighborhood is unsuitable for the chestnut; and I believe the nearest tree that grows wild, is seven or eight miles from this place. When transplanted into common soil, the leaves assume a sickly, whitish cast. I have a Spanish(?) chestnut however, in my garden, which grows in a border of *selected earth* about three feet wide and fifteen inches deep; and it would be very productive, if the *anthers* were not so far diseased as to yield little or no *pollen*. Previous to the present season, it had not produced to my knowledge more than four or five chestnuts in ten years. In the summer of 1849, I ascertained the cause of its barrenness, and thought of applying pollen from the wild kind; but it was not convenient to do so then, and the thing was omitted. In the last summer however, a branch was accidentally brought home by one of my family; and though I knew it not till next day when it was withered, I shook it over the lower limbs, and the result has been several dozens of fine chestnuts.

I intend to plant a wild tree in the same border.

The theory of this process has been known since the days of Linnæus; but persons who are botanists have been surprised and amused at the result. D. T. *Greatfield, near Aurora, N. Y., 11 mo. 1, 1850.*

Experiment with a Plum tree—*Carculio* repelled!

WILLIAM HOOPER of Kelloggsville, Cayuga Co., has a plum tree which had regularly dropped its fruit prematurely until the present season, when it bore a fine crop. Its productiveness is ascribed to the following experiment:—Round the tree, at the distance of a foot or more, a small trench was cut last spring, and filled with several quarts of salt. The directions (which were found in a newspaper) mentioned a peck to each tree; but apprehensive that so much might prove injurious, they lessened the quantity. The tree appears quite healthy. D. T. 11 mo. 4, 1850.

Sharp Frosts in Valleys.

LAWRENCE YOUNG, Chairman of the State Fruit Committee for Kentucky to the Pomological Congress, states the following fact in illustration of the advantages of planting tender fruit trees on elevated ground instead of in valleys. Lieut. Maury placed a thermometer on a high portion of his orchard grounds, and another at the bottom, thirty-five feet lower. At 1 A. M. he found the thermometer at the bottom at 28°, and being surprised to see that on the hill at 33°, changed their position, but was soon convinced that there was a difference in temperature between the two points of *five degrees*.

ENGLISH AND SCOTCH ACRES.—The English acre contains 4,840 square yards—the Scotch, 6,150. The Scotch acre, therefore, is rather more than one-fourth the larger.



BLACK-FACED SCOTCH SHEEP.

The Farmer's Note-Book.

Black-Faced Sheep of Scotland.

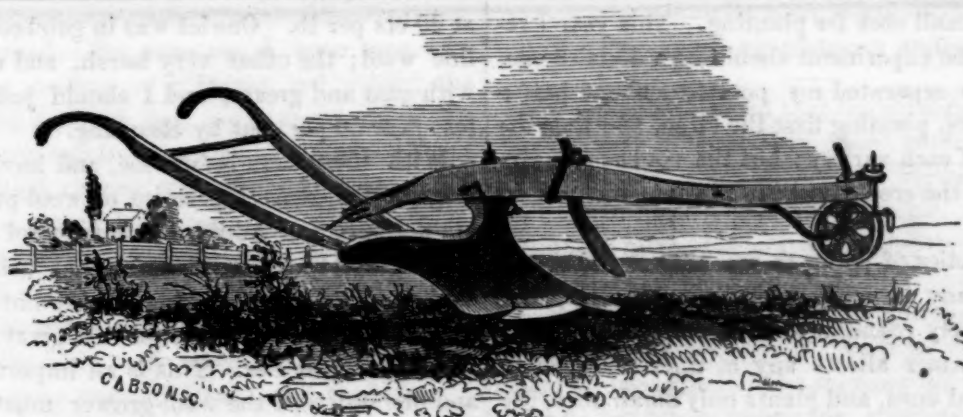
IN the pastoral districts of the Highlands of Scotland, the Black-Faced breed of sheep has been kept from time immemorial. The Cheviots have latterly been introduced to some extent, but it is still held, that "in the bleakest and wildest pastures of the mountain ranges, no sheep but the Black-Faced can exist." The breed is uncommonly hardy, and the mutton is remarkable for its fineness and delicacy of flavor. Good wethers average sixteen pounds per quarter. The wool is chiefly used for carpets and the coarser kinds of worsteds. It weighs about four pounds to the fleece. It is thought by some who have seen these sheep in their native country, that they might be advantageously introduced in some of our mountainous districts—as the Allegany range, &c., where they would subsist chiefly on the natural vegetation.

In our last volume, pages 48, 49, we gave some remarks, together with a cut, in regard to the management of sheep in the Highlands, and suggested that some of the practices there pursued might be properly adopted in this country. Our readers may be interested in a few observations in reference to the mode of living, and the character of the Scottish shepherds. Martin remarks—

"The plan on which these men are engaged is admirable, and binds them to their employer's interest, or rather makes their mutual interests the same. For example, if the shepherd be a married man he is allowed a cottage, generally consisting of two apartments, with a little garden or kail-yard and a potato patch. He has also grazing ground for one or even two cows, and the liberty of pastur-

ing on his employer's land from ten to fifty sheep, sometimes more, during summer and winter, with their lambs, to a certain time. In addition to these privileges, he has a certain allowance of oats, barley, and peas, for the sustenance of himself and family. In this lone hut upon the mountain's side, dwells the shepherd, his family, and his dog. During the summer all is pleasant. True, his life is monotonous, but the Scottish shepherd, peasant though he be, is not uneducated, and his own mind affords him resources against *ennui*. Men celebrated in the paths of literature have been for years the tenants of such a cottage, and keepers of another's flock. But winter comes on with its storms and tempests, and then the utmost activity, vigilance and experience of the shepherd are called into full exercise. He is ever anxious, ever on the watch for changes of weather, and his family, nay his faithful dog, participate in his solicitude."

"I know of no scene," says the Shepherd-poet of Ettrick, "so impressive as that of a Shepherd's family, sequestered in a lone glen during the time of a winter storm. They are left to the protection of Heaven alone, and they know and feel it. Before retiring to rest, the shepherd uniformly goes out to examine the state of the weather, and make his report to the little dependant group within. Nothing is to be seen but the conflict of the elements, nor heard but the raving of the storm. Then they all kneel around him while he recommends them to the protection of Heaven; and though their little hymn of praise can scarcely be heard even by themselves, and mixes with the roar of the tempest, they never fail to rise from their devotions with their spirits cheered and their confidence renewed. Often have I been a sharer in such scenes, and never in my youngest years, without having my heart deeply impressed.



CENTER DRAFT PLOW, NO. 40.

We lived as it were, inmates of the cloud and the storm, but we stood in relationship to Him who directed and governed them."

Center-Draft Plow, No. 40.

THIS is a new pattern, brought out by Messrs. PROUTY and MEARS, Boston. It is constructed with special reference to deep and narrow furrows, and may be called a stiff-soil plow. We had the opportunity of seeing it tried, in November last, on the farm of E. P. PRENTICE, Esq., near this city, where its operation was in the highest degree satisfactory. It was gauged to work ten inches wide and seven inches deep, and cut the furrows according to these dimensions, with remarkable exactness, running at the same time with great steadiness, and requiring comparatively little aid from the plowman. It leaves the soil in an open and friable condition, and effectually buries the vegetation.

First Wheat raised in Western New-York.

EDS. CULTIVATOR—In the commencement of the summer of the year 1788, about twenty men, some of whom were accompanied by their families, met at Schenectady, in New-York, and embarked on batteaux for the western part of the State. They were followers of Jemima Wilkinson, who styled herself the "Universal Friend," and were going to the "promised land" which three of their agents had discovered the preceding year on the banks of a beautiful lake, now called the Seneca. They had horses and wagons to use when water carriage failed. They found but two log houses at Utica, one at Whitestown or Fort Stanwix. A pioneer by the name of Jennings had just moved into a log house, which the Indians had assisted in raising, near where the Franklin house now stands, in Geneva. This was the only house in Geneva, the only one they had found since leaving Fort Stanwix. With their batteaux, they proceeded up the lake to where the Ovid Landing now is. Here they staid about a week, searching after a stream on which to erect a mill. Not being able to find one, they crossed to the west shore of the lake, about a mile south of West Dres-

den—were pleased with the mill seats on the outlet of Crooked Lake, and with the country. It was now the month of August, and they began the "Settlement" with vigor, agreeing to sow the first wheat in common. They cleared about 40 or 50 acres, judging that there would be two acres for each man. It was about the first of November before the wheat was sown—the quantity being at the rate of about one bushel per acre. No plow was used in preparing the ground—harrows, with wooden teeth, mellowed the newly-cleared soil, and covered the seed. It was harvested the succeeding July, and yielded about fifteen bushels per acre.

It may be interesting to add, that the first and second season, some of the settlers cut wild grass on the alluvial deposit at the head of the lake, where Jefferson now is, and conveyed it down the lake on batteaux, 25 miles, to the "Settlement." This, with what the cattle obtained from shrubs and trees, enabled them to live through the winter. I should have stated that the ground first sown, is now under cultivation, and often produces 30 to 40 bushels of wheat per acre. It belongs to Joseph Ketchum and Robert Norman. S. B. BUCKLEY. *West Dresden, Yates Co., N. Y., Nov. 11, 1850.*

"Small Potatoes" for Planting.

MESSRS. EDITORS—In the November number of the Cultivator, is an article on this subject, stating that superior crops have been raised from the use of small potatoes for seed, and asking further information.

Formerly, I believed in the common opinion, that large potatoes must be used for seed, to insure a good crop; but in 1845, owing to the failure of the previous crop, I was obliged to use small ones, none larger than a hen's egg, and the result was truly surprising. The yield was about 100 bushels from half an acre of unmanured ground, and they were almost uniformly of fine size. Many hills had none that were so small as the largest I planted.

But old opinions require a long time to root them out; and ever since, my potato field has been an experimental one, to determine this point. In no case have I been able to decide that large potatoes were

better than small ones for planting. This year I resolved that the experiment should be a decisive one, and therefore separated my potatoes, about half a dozen varieties, planting first the large, and then the small ones of each variety; but the rot has so nearly destroyed the crop, that the result could not be observed.

Some varieties of potatoes are almost uniformly small, with any cultivation they may receive, and they also closely resemble some of the best varieties. Now if the farmer allows any of inferior kinds to mix with good ones, and plants only small ones, the inferior varieties will obtain the superiority, and the crop will deteriorate.

A large proportion of the small potatoes which are produced, are either the result of too much seed being used, or cultivating the crop after the first set of tubers have formed, so that another set starts out of small size.

The opinion, therefore, which I have formed, is, that small potatoes of a good variety, are at least equally good with the large ones for seed. T. S. GOLD. *Cream Hill, Ct., Nov. 4, 1850.*

Wool and "Gum."

EDS. CULTIVATOR—I have read your remarks upon the Addison county sheep, published in the November number of the Cultivator. To your inquiry as to the object of producing so large a quantity of that gummy matter, you were, you say, answered that it was considered "profitable so long as the manufacturers or their agents would pay for it at the same price per pound as for wool." This answer somewhat surprised you. I formerly believed that wool was what a manufacturer wished to purchase under the denomination of wool, and I supposed that if their business required the use of oil, or gum, or grease, they would prefer purchasing those articles separately, as it is somewhat difficult to ascertain the exact proportion that the wool bears to the grease and gum.

I have carefully perused an article published in the *Vermont Mercury*, written by J. M. Colburn, Esq., of Springfield, Vt. He is a large wool-grower, and has for many years been a large purchaser of wool for the eastern manufacturers. He speaks of a noted buck which produced annually a fleece weighing from eleven to twelve and a half pounds. He purchased the clip of wool which belonged to this remarkable buck. The manufacturer directed his stapler to ascertain the quantity of wool that fleece contained. The fleece, before cleansing, weighed eleven and a half pounds, and there proved to be precisely *four pounds* of wool, harsh and ordinary in quality, though in its first state it appeared rather fine. He gives also the relative loss of three other lots of wool. The first lot 27 per cent, the second 35 per cent, and the third 41 per cent, by cleansing. I examined two lots of wool purchased in this town

at 40 cts per lb. One lot was in good condition, and fine wool; the other very harsh, and much mixed with gum and grease, and I should judge it would lose near 50 per cent by cleansing.

With these facts before me, and having a knowledge of the general practice of wool-purchasers, I am not sure the Addison county wool growers do not act wisely. I will admit, that with 40 years' experience as a wool grower, I have not been able to learn wherein the value of this great quantity of grease and gum lies. This is an important subject, and one in which the wool-grower must feel a deep interest. I hope, therefore, you will obtain, if possible, the services of Professor Norton, to make an examination and analysis of this matter. He possesses a remarkable talent of presenting a subject in such a way as to appear clear to any mind of common capacity, and if he can, with his superior knowledge of chemistry, show the wool-grower wherein consists the great value of this gum and grease in wool, he will add as much to the interest of sheep husbandry, as he has already done to other branches of agriculture. J. S. P. *Vermont, Nov., 1850.*

Devon Breed of Cattle.

EDS. CULTIVATOR—The first Devon cattle, of pure blood, that I ever saw, were brought into Litchfield county, Connecticut, by Lemuel Hurlbut, Esq., about 30 years ago. Their color was a pure mahogany-red, free from white, except the brush of the tail. They had short heads, broad across the eye, with long, slim horns, standing high upon the head. I was very much pleased with them, and commenced crossing from them, first with the Heaton breed of cattle, and afterwards with the Durham, introduced by the late Henry Watson, of East Windsor, Ct. About seven years ago, I purchased the pure blood bull Matchless, bred by Col. White, of Danbury, Ct., and also a cow and heifer of Mr. Hurlbut. Since that time, I have purchased a number of females from the stock of Col. White, all free from visible marks of impure blood. I have for several years endeavored to carry out the principles of thorough breeding. I do not claim that all my stock are of pure blood, but I have a number that are entirely unmixed Devon. A part of my stock are crossed, as before mentioned. I never saw any white on a pure Devon, except at the end of the tail, till within the last few years.

Some fresh importations have now been made, and it is thought by some, that we should cross those bred in this country with those lately introduced. It is, however, important to breed from animals which show no impurity of blood. Some animals of the late importations, show some points which are different from what I have heretofore regarded as indicating pure blood. I do not say they are not pure, but as they are in some respects different from the Devon stock we have before had. I wish the

subject explained. For example, I have seen two large and fine heifers, of a bright red color; the skin about the eye and bag, not a cream color, as with the first of our Devons. They resembled those of the first stock crossed with the Heaton breed. I have also seen a very large and fine yearling bull, imported the past season. He is well formed, has good limbs, a round neck, long face, narrow across the eyes, thick horns, a white skin, and some white hairs under the belly. He resembles animals I have seen which were a cross of Devon and Durham.

I have been told that the Devons have been bred in England, latterly, chiefly for beef. In this country, we should have three objects in view in breeding stock. The first and most important is the milking quality; second the working quality, and third the fattening quality, as all are designed for beef at last. It is of the greatest importance that we breed our Devon stock with both milking and working qualities. In selecting stock for the dairy, a yellow skin is important; those cows which have a white skin are likely to give thin and poor milk; and it is also important that our male animals should come from good milking families. J. N. BLAKESLEE. Watertown, Ct.

It will not be denied that there is a difference in the points and markings of some of the Devons lately imported, and those imported thirty years ago; but we do not think it necessary to conclude that this difference has been occasioned by a cross with the short-horns, or any other breed. Breeders have different standards, and this occasions, in a few generations, a corresponding difference in the points of animals of the same original stock. For instance, if two men were to purchase of our correspondent, ten of his Merino sheep, and should continue to breed from the stock without the least admixture—the one endeavoring to produce sheep with long, narrow faces, and the other those of an opposite character; is it unreasonable to believe that after thirty years, there would be a marked difference in the two families thus bred?

The qualities which should be chiefly regarded in stock, depend on the circumstances of the breeder. The relative value of milk, beef and labor, must determine which shall be the primary object.

The stock alluded to by our correspondent as the "Heaton breed," was probably derived from the short-horns imported by ROBERT HEATON of Throgg's Neck, Westchester county, N. Y., in 1792, and which were obtained by him of the celebrated English breeder, GEORGE CULLEY, author of *Observations on Live Stock*, &c. Eds.

NUMBER OF PLANTS EATEN BY DIFFERENT ANIMALS.—It has been calculated that

The Cow eats	276 plants, and rejects	218
Goat do	449	do 126
Sheep do	387	do 141
Horse do	262	do 212
Hog do	72	do 271

National Agricultural Bureau.

WE are much pleased that the establishment of an Agricultural Bureau has been recommended by President FILLMORE in his late message. The report of the Secretary of the Interior, Mr. STUART, also takes up the subject, and urges the formation of the new Department by sound and cogent reasoning. The suggestion in regard to the purchase of the estate of Gen. WASHINGTON, we hope will be seconded by all who cherish the memory of that eminent patriot, by whose far-seeing wisdom, a National Board for the improvement of Agriculture was first recommended. The following remarks of Mr. STUART, we trust will receive the consideration to which they are entitled:

In surveying the various interests of the country, no one can fail to observe how little has been done by our government to promote the cause of agriculture. It is true, the cultivator of the soil, in common with all other classes of society, enjoys the protection of the laws and the blessings incident to good government. But something more seems to be due to a branch of industry which employs more than half our population, and, to a great extent, sustains the other.

The power of the general government over this subject is limited, but this furnishes no good reason why it should not be exercised so far as it does legitimately extend.

The ordinary means adopted to afford protection to the manufacturing and commercial interests are comparatively inoperative in regard to the agricultural. A tariff can do but little, directly, to benefit the farmer or the planter.

The staple productions of the South are peculiar to that climate, and therefore are in no danger of competition from abroad. Those of the North and West, in consequence of the fertility of the soil and the low prices at which land can be bought, are produced at less cost there than in other countries, and consequently, except under extraordinary contingences, need no protection by imposts on the breadstuffs of foreign nations.

But still much may be done by government, at small cost, to promote the interests of agriculture. The science is yet in its infancy, and great minds are now directed to the study and development of its true principles. Experiments are in progress to ascertain the qualities of different soils; the comparative nutriment of vegetable productions; and the utility and efficiency of various manures in fertilizing and renovating the exhausted lands of the old states.

Encouragement may be afforded to enterprises like these, and facilities furnished for the collection of seeds, plants, and vegetables from all parts of the earth, and their distribution throughout the country.

Premiums may be offered for the best practical treatises on the different branches of husbandry, which can be published and sent abroad among the people. By means like these, a spirit of philosophic inquiry may be stimulated, and a great impulse given to the interests of agriculture. Much has already been done in this respect, through the agency of the Patent Office; but the subject is too important to be left in this dependent condition. The last annual report from the department, recommending the establishment of an Agricultural Bureau, to afford to this great branch of American industry the encouragement which it so well deserves. This is no novel suggestion. It had the sanction of Washington, who, in his last annual message, referring to the propriety of creating an Agricultural board, said:— "This species of establishment contributes doubly to the increase of improvement, by stimulating to enterprise and experiment, and by drawing to a common center the results, everywhere, of individual skill and observation, and spreading them thence over the whole nation. Experience accordingly

has shown that they are very cheap instruments of immense national benefit."

I therefore renew the recommendation of my predecessor for the establishment of a separate bureau, to be entrusted with the duty of promoting the agricultural interests of the country. The vast extent and rapid development of the mineral resources of the country seem to require that adequate provision should also be made by law for the collection and analysis of the various mineral substances which have been, or may be discovered, so that their properties may be understood, and their value correctly appreciated.

The purchase of a farm in the vicinity of the national metropolis, to be tilled and managed under the direction of the bureau, has been suggested as an important auxiliary in illustrating the best modes of culture. If this idea should be favorably received, I would respectfully add that Mount Vernon, whose soil was once tilled by the hands, and is now consecrated by the dust, of the Father of his Country, should properly belong to the nation, and might, with great propriety, become, under its auspices, a model farm to illustrate the progress of that pursuit to which he was so much devoted.

Economy of Manures.

WE have been greatly interested in the perusal of a lecture with this title, delivered by Dr. THOS. ANDERSON before the Highland and Agricultural Society, and published in the *Transactions* of that association. Dr. A. observes that there are many questions in regard to manures which are yet unsettled, and that these questions can only be solved by the mutual exertions of "science and practice." He says:—

"I hold it to be certain that the two must go together, and that though some of the facts we require may be determined in the laboratory, there are many questions which, though suggested by science, can only be established as facts by experiments in the field, performed with every attention to care and accuracy. I hold, also, that neither of these methods of experiment will in themselves suffice: they must go hand in hand if our results are to be of value; while separately, the chances are that they lead to mere speculations, of which science will supply one set, and practice the other."

In regard to the value of stable, or farm-yard manure, Dr. A.'s views are quite different from those of Dr. GARDNER, to which we made some allusion in a late number. Dr. A. observes:—

"You will readily perceive the necessity for our directing attention to that manure in which the substances which nourish plants may be said to exist naturally; and that, of course, is farm-yard manure—the most important of all; that on which the farmer must always be dependent; and, I think I may also say, that regarding the economical management of which we have the least definite information. I beg it to be understood as my decided opinion, that farm-yard manure must always be the farmer's main stay. I am aware, indeed, that some have thought otherwise; and we have all heard of an eccentric gentlemen, who expressed his opinion that the time would come when the farmer would carry his manure to the field in his waistcoat pocket. No one now-a-days entertains such fancies; but there are people who seem still to expect that some complete substitute will be found for farm-yard manure. I can assure you, however, that any such supposition is entirely extravagant, and is certainly uncountenanced by chemistry. I do not mean to say that chemistry cannot produce a substitute, but what I mean is, that farm-yard manure must always be *much cheaper* than any substitute which could be manufactured; and the reason is to be found in the fact that the constituents of such a manure must be extracted from plants by a series

of complex chemical processes, which must necessarily add greatly to their expense.

"I consider, then, that farm-yard manure is the most important of all, as the natural, cheapest, and most abundant source of the more important constituents of our plants; and that for these and other reasons, we can never expect to replace it by any artificial manure capable of performing all its functions, or serving the purposes of cultivation throughout a succession of years. Under these circumstances, the attention of the farmer should be specially directed to obtaining that manure in its best state and preserving it without deterioration."

In regard to the preservation of manure, Dr. A. remarks that much of the valuable portion of manure is lost by exposure to the air and rains. The circulation of air causes the ammonia to become volatile, and the rains wash out the soluble substances. So far as regards *volatility*, the mixing of gypsum, muck, litter, or earth, may obviate the difficulty; but the liability to injury by rains still continues. To protect the manures against both these sources of loss, keeping it under cover would be most effectual. This shelter might be secured either by a cellar under the barn, or the erection of cheap sheds over the manure heaps.

In regard to bones, Dr. A. thinks it a very erroneous notion that their action as manure is wholly owing to their phosphoric acid. He says:—

"Bones in a fresh state contain a quantity of nitrogen capable of yielding from five to six per cent of ammonia, and there cannot be a doubt that in many instances they act as much by their nitrogenous matters as by their phosphoric acid."

The instances in which burnt bones have produced striking effects, have been comparatively rare, and are confined to soils which were deficient in phosphoric acid merely.

Bones for Manure.

EDS. CULTIVATOR—I wish, in as few words as possible, to give you my experiment in dissolving bones, and their use as a manure.

I was led to make the trial by reading Professor Norton's communications. About the first of May, I bought an old molasses-hogshead, sawed it in two, and put in one half 100 lbs. of broken bones, and 50 lbs. sulphuric acid, adding about two parts water to one part of acid. I intended the bones for my corn-hills, but after turning and stirring, and stirring and turning for about three weeks the bones were about as whole as ever, except what had worn off in stirring. I then abandoned them, as planting was done, and other business required my attention.

After hoeing, having a little more leisure, I made some examination, and came to the conclusion that the acid was poor, or else I had added too much water. I then added 18 lbs. acid, and in three or four days I had a fine tub of paste. I was then at a stand, as was our friend Hutchins, of Vermont, what to do with it, as the season was so far gone, but I made up my mind to put it on my potatoes, which I was then hoeing the second time; and for

experiment, I put it on every alternate row—about a large spoonful to a hill.

When I dug the potatoes, I weighed ten hills in a row, for 12 rows, through the most equal part of the field, and now give you the result, as follows:

	Dissolved Bones.	Nothing.
First row,.....	8½ lbs.	6½ lbs.
Second row,.....	7½	6½
Third row,.....	8½	7
Fourth row,.....	7½	6½
Fifth row,.....	7½	5½
Sixth row,.....	7½	8½
	47 lbs.	41 lbs.

Making a difference in favor of the bones, of near 15 per cent. The 100 pounds was used on every alternate row on three-fourths of an acre, making three-eighths of an acre, hills two by three feet apart, which gives 7,260 hills to an acre, or it was put on 2,722 hills. The 60 hills without manure, made 41 lbs, which, allowing 62 lbs. for a bushel, would yield 80 bushels to an acre, and the manured or boned part would give 92 bushels to an acre; an increase of 12 bushels to an acre, which at 50 cents per bushel, (mine are selling quick at that,) would give an increase of \$6 per acre.

Allowing 60 lbs. of acid to 100 of bones, which I think would be sufficient, it would require 160 lbs. to an acre, and it may be bought in Boston, New-York or Hartford, for 2½ cents per lb,..... \$4 00
Use of carboy, 25

\$4 25

leaving \$1.75 for tub, freight, trouble, &c.

In this instance, one would be well paid for all trouble in the increased size of the potatoes. My children, in their simplicity, remarked that they should suppose that one parcel was selected from the other.

The crop was on a worn-out, sandy plain, without manuring, which will account for the smallness of the crop; but I think the strength of the manure is not all gone yet.

It being dry weather when the paste was made use of, it soon became dry, like old mortar, and much of it remains so now. It has lost its acidity, and is perfectly tasteless. I think if I had mixed dry ashes, or something to absorb the moisture, and converted it into dry powder, so that it could have been more equally distributed, I should have had a much better result, and I think it would be still better to mix it with the earth, when the potatoes were planted. As to Mr. Hutchins' inquiry about the best method of dissolving bones, I think I should make a plank cistern, perhaps one foot deep, and place it below the surface of the ground, and with a stout wooden shoven, with a handle 15 or 20 feet long, a person might stir it about, and turn it over with safety, and when the cistern is not in use, fill it with earth to preserve it from drying. I tried putting some of the paste, (perhaps a tea spoonful to each,) under some cabbage plants, when I was transplanting, and where I put it, I have small heads, and where none was put I have no heads.

I have endeavored, as much as possible, to give a correct statement of my experiment with bones, and am fully convinced that there are bones enough thrown away every year, to increase our potato-crop 15 per cent, to say nothing of the after benefit. W. A. ELA. *West Springfield, Mass.*

Transmutation.

EDS. CULTIVATOR—Many years since, whilst harvesting, I found a head of wheat, and out of the top of that head grew a sprig of chess. I know of many men in this and the adjoining county, who have found heads of wheat and chess, similar to the one here described, growing upon one and the same stalk. I would ask through your paper, how that stalk which produced part wheat and part chess, originated? Did it spring from wheat, or from chess, or from both; or has "an enemy done this?" LUTHER REDFIELD. *Clyde, Wayne county, N. Y.*

The above may be taken as a fair sample of scores of communications we have received on the same subject. The accompanying cut, we think, will show our correspondent "how that stalk produced part wheat and part chess." The chess was entangled in the wheat-head. We have seen several cases of this kind, which were brought forward as demonstrative proof that wheat had "turned" to chess; and tho' we could never perceive that the notion of transmutation rested on any better foundation, it seems strange that its advocates should not have discovered that such examples afford them no support at all.

The head of wheat and chess, of which the above is a copy, was sent to the office of the *Genesee Farmer*.—We are informed by that paper, that the man who left it, thought himself entitled to "the prize," for having proved that wheat and chess were both produced by the same stem. By close examination, and bending down the chaff near the dotted line, the end of the chess stem could be plainly perceived, and it could



be seen that there was no actual connection of the two heads. All the cases which have been brought to our notice, (except one where the chess was attached artificially,) have been similar to this.

Poultry-House and Grapery.

IN a late visit to Massachusetts, we had the opportunity of examining a poultry-house and grapery combined, which has lately been put up by Col. JAKES, for his son, at the Ten-Hills Farm, near Boston. Three acres of land have been enclosed, and within the enclosure is erected a building, 100 feet long and 22 feet wide, fronting to the south-east. This building is divided lengthwise, by a partition,—leaving one division twelve, and the other ten feet wide. The wider apartment is in front, is covered with glass, and is used as a cold grapery; the narrower is used as a shelter for fowls. The area for the building was partly formed by excavation, and the rear wall, which is of stone, stands against a bank ten feet high.

The manner of forming the bed for vines, was as follows: After the ground was properly shaped, a drain, three feet deep, was dug entirely round the outside, so as to turn the cold, underground water away from the roots of the vines. The bed comprises the whole of the area of the building, and a strip additional of the same length along the front, fifteen feet wide,—making 100 by 37 feet. At the bottom of the bed, was placed a layer of brick-bats, three inches thick. It was then raised three feet in thickness by a compost, the materials of which were chiefly stable manure, marsh mud and loam, which had laid in a heap for several months, and to which was added forty loads of ashes and burnt clay from the beds of old brick-kilns, the bones of twenty horses, and fifty bushels of oyster shells.

The vines, mostly of the Black Hamburgh variety, were planted inside the building, but close to the outside, the latter part of May last, and made a growth of from twelve to sixteen feet the same season. The vines are to be laid down in winter, and the fowls during that season, are to have the range of the vinery.

The apartment for the fowls, is well lighted and ventilated by doors at the ends and windows near the roof—the roof over the fowls being two feet higher than that over the grape-vines. Boxes for nests of the fowls, are ranged along the partition wall. A wall five or six feet in height, is to extend from each end of the rear wall of the building, so as to protect the north and west sides of the enclosure. Against this wall, are to be made beds, with glass over them, for early vegetables, and when not used for this purpose, the glass is to afford shelter to geese, ducks, or other poultry.

The ground enclosed, is to remain chiefly in grass. Within the enclosure is both salt and fresh water

—a separation being formed by a dike. The water covers an area of 3,700 square feet, in the shape of an egg. The fresh water is derived from springs, which are conducted into the reservoir. The reservoir for salt water is so made that the tide ebbs and flows two feet in it. The water in the fresh-water reservoir, when raised above a certain height, discharges itself into the salt-water reservoir, which is on a little lower level. The experiment of keeping fish, of various kinds, in these reservoirs, is to be made the coming season.

The poultry kept here, has been mostly collected since the building was completed, a large proportion having been reared from the egg the past season. Of course, little can at present be ascertained as to profits. The collection embraces domestic fowls, turkeys, Guinea-fowls, pheasants, pigeons, geese and ducks,—the whole numbering about 500—to be increased to such extent as shall appear expedient.

The principal object in regard to fowls, is the production of eggs, and for this purpose a selection of the common fowls of the country was made; but specimens are kept, in addition to these, of the principal distinct varieties. Of geese, we noticed the wild, or Canadian, the large Chinese, or Hong-Kong, (sometimes called African and “mountain goose,”) the small grey Chinese, white Chinese, and Bremen. Of the latter there is a splendid stock, derived from an importation made by Col. JAKES in 1822. The female of the imported pair is still living, and has reared a brood every year since she has been in the country, and bids fair to do the same for as many more years. The ducks comprise the most esteemed domestic varieties, as well as several wild species, which have been partially domesticated. Among the latter, we noticed a flock of about twenty of the beautiful wood or summer duck, and several pair of teal.

Most of the poultry, except the geese, are kept in the building before described, every night. The apartment is cleanly swept out every day, and the manure, which is carefully saved, is sold at one dollar a barrel to the morocco-tanners.

The bulk of the food for the poultry, consists of Indian corn, but buckwheat and wheat-screenings are given for variety, and they are kept constantly supplied with butchers' offal and green vegetables—as cabbage and turneps.

We shall look with interest to the success of this novel establishment.

Large Yield of Hay.

IN our number for August last, we published a paragraph in reference to a large yield of hay, obtained by H. W. CLAPP, Esq., of Greenfield, Mass.

We learn from the *Greenfield Republican*, that the lot was mowed twice last season, and the amount of the two crops is given as follows: “In July, the first crop was cut, and cured; and we have the au-

thority not only of Mr. Clapp but the workmen, that it was *well* cured. The crop was all weighed, and yielded 29 tons, and 497 pounds. In September, the second crop was cut and weighed, and produced 14 tons and 97 pounds—making together 43 tons 594 pounds. The area of the lot is 7 acres and 100 rods. This is very nearly six tons to the acre." The hay is stated to have been sold at \$10 per ton, which gives the yearly income of \$432 for the 7 acres and 100 rods. The *Republican* states that the lot was formerly quite uneven. Mr. Clapp leveled it, and plowed and subsoiled it, after which it was seeded to grass. It has since been annually top-dressed with about 100 loads of manure, which costs one dollar a load. The crops have been extraordinary, that of 1849 having been nearly equal to that of 1850.

Irrigation.

EDITORS CULTIVATOR—I read with much pleasure, an article under this head, in your December number: yet there are some parts of it, in which I do not concur, and which I think erroneous as regards the eastern or middle sections of the United States. It is stated that "the proper season is from about Michaelmas till Lady-day; but Mr. Turner entirely objects to summer irrigation, as forcing the land too much, and as calculated to give the sheep, who then depasture upon it, the rot."

My experience, of 30 years, is entirely different. I have used water in irrigation, on mowing lands, from as early in the spring as the frost is out of the ground, until about the time of making hay on the land; and after the hay has been gathered into the barn, occasionally until the setting in of the frost of the succeeding winter; and have had no reason to believe that I was "forcing the land too much." Some of my land has been in grass for the whole period, and has had no manure, except that derived from the water, and the droppings of the cattle, when feeding off the aftermath. The hay crop has been larger of late years, than it was at the commencement of the time above stated, and the average crop is sufficiently large to satisfy the reasonable expectation of any farmer, even from his best land. I have for two winters allowed the water to run on my land, but shall not again irrigate at that season of the year. I received no injury, where the descent was so great, as not to allow the water to become stagnant, but in hollows, where the water was without motion, it would freeze over, and if the ice was transparent, so as to allow the sun's rays to pass through, the grass was destroyed.

Whether summer irrigation will produce the rot in sheep, I have no practical knowledge, but should think it improper that any animal should be pastured on irrigated land, when it is wet. My practice has been, to let on the water after haying, for several days, until I think it properly wet; I then shut it

off, and when sufficiently dry, I allow my cattle to feed off the grass, and this I repeat from time to time through the season, as I have occasion. From this procedure, I have discovered no objection, except the additional labor in keeping the ditches in repair, which have been damaged by the hoofs of the animals feeding on the land.

I also object to a part of Mr. Turner's directions in relation to the construction of his second ditch; of the first and third I fully approve. He says "in the hill-side meadows, the gutters conduct the water from a spring on the upper part of the hill-side, in a lateral, but oblique direction, with a gentle fall across the face of the hill. At the opposite side, but so arranged as to leave a considerable interval between each main gutter, it turns, and brings the stream back, at a lower point, across the face of the hill again, and somewhat parallel with the first line, but still descending, when it again turns, and so on till it reaches the bottom."

It will be perceived, that at the "opposite side," the space between the second and third, and fourth and fifth ditches, will be greater than at any other place, so much so, that a portion would not be equally watered with the other land. I have also practiced side-hill irrigation. My practice has been to have my several ditches as parallel as the formation of the land will allow, preserving a proper descent for the water, the water to run in the same general direction in the ditches. From every spring there is a channel down the hill, formed by the running of the water. In this channel, I have small flumes or hatches, with gates, just below where I wish to commence my ditches; the first as high on the hill as I can use the water, and it is usually the case that ditches may be run each way from the channel on the side of the hill. I take the water into the highest ditch, and allow it to run over the side for its whole length, and as equally as is practicable; it then passes over the pannel below, and in its course, from the inequality of the land, will get formed into little rills, to the ditch below. Hence it is desirable that the pannels should not be too wide. The water is intercepted by the second ditch, and by it, in the same manner is diffused over the land. And so on for the whole face of the hill, if there is sufficient water to irrigate the whole of the land at the same time, which is not often the case. If the supply of water is insufficient for that purpose, I first irrigate so much of the higher part of the field as I have water for, then let it run down the original channel to a pannel, where I wish to use a part or the whole of it, and there irrigate as on the first pannel. I have found that the effect was more beneficial, when the water was made to run over the side of the ditch, and strain through the stems of the grass, than where it moistened the roots of the grass by percolating through the earth. Each

of the ditches should have a flume at its mouth to control the water at pleasure.

Probably there is no one thing, in relation to a farm, so useful and so much neglected, as irrigation. There are but few farms, on which hill-side irrigation may not be practiced to advantage, for at least a portion of the year. In the spring months, the water from the dissolving of the snows, and from the rains, is too often permitted to carry the richest portions of the soil off the hill, without obstruction, into the swamps and mill-ponds, where it is forever lost to the farmer; for the want of a few ditches, readily made with the plow, at a trifling expense, which would enable him to strain the water before it leaves his premises, retaining its enriching properties for the benefit of his future crops. Even in those cases where the stream is small, and but of few days continuance, it will be an object for every farmer to make his ditches, and use all the water (if he can) in irrigation. He will then be convinced of the truth of Mr. Turner's declaration—"remember, gentlemen, that *the artificial watering of meadows robs no dung-hill; on the contrary, it raises one for the benefit of other lands.*" It should be recollected that the term *meadow*, is in England applied to all mowing land, whether wet or upland.

I would not be understood as denying that the time between Michaelmas and Lady-day, may be a suitable period for irrigation in the climate of Great Britain, but as an unfit time for that object in the middle and eastern portions of the United States. In England the winter is far more mild, and the summer, from the frequent rains and fogs is much more wet, and so cold, that Indian corn will not ripen its seed. Hence the difference may arise.

JOHN W. LINCOLN. Worcester, Mass., Dec. 11.

Studies in Natural Science.

WE have received from Mr. JOSIAH HOLBROOK, several articles written by him for the NATIONAL INTELLIGENCER, designed to show the importance of a knowledge of the connection of geology and chemistry with agriculture. This design is carried out in a manner which cannot fail to interest and benefit the practical farmer. The illustrations are of the most simple kind, and the technical terms, which are often objectionable to novices, are explained in the plainest manner. The subject is thus brought within the comprehension of those commencing with the rudiments of scientific agriculture. We commend the articles to the attention of our readers. Eds.

Connection of Geology & Chemistry with Agriculture...No.1.

No class of the community have an equal interest in geology with farmers. No science is so interesting to farmers as geology, in connection with chemistry. The two sciences cannot be separated and justice done to either. While the elements of our globe, especially of soils, require chemical tests to determine their character, these very elements are absolutely essential for

experiments to determine the fundamental principles of chemistry. Oxygen, the most powerful chemical agent in creation, is also the most abundant material in rocks and soils. The one as an element, the other as an agent, are alike essential to each other, and both indispensable, as at the foundation of all agricultural science.

A knowledge of each is as feasible as it is important—entirely within the comprehension of a child six years old. Each is a science of facts more than abstract reasoning—of facts, too, equally instructive and delightful to every young mind.

Take an example: The child has placed before him two glass tumblers—the one containing quartz, the other lime or sand and chalk. The name of each is of course as readily learnt as the name of iron, lead, gold, tree, horse, or any other object in Nature or Art. Into each tumbler is poured some sulphuric or muriatic acid. In the tumbler of lime the pupil observes an action—in that of quartz no action. He is told this action is called effervescence. He hence learns to recognize lime and quartz, and the more certainly from the recollection that the one effervesces with acids and the other does not.

Here is an example of geology and chemistry, alike useful to the farmer and interesting to the farmer's child, or any child. The same simplicity and direct fundamental instruction run through the whole of both of these exceedingly practical sciences.

I will hereafter point out a few of the leading principles of these sciences; their connexion with each other; their essential importance to all classes, and, most of all, farmers; their exceeding fitness for the early instruction of children, and the entire feasibility of having them among the "first lessons" taught in each of the eighty thousand American schools.

Oxus is the Greek word for *acid*; *ginomai*, in Greek, means *make*; hence the literal meaning of oxygen is *acid maker*. Combined with sulphur it forms a sulphuric acid; with nitrogen, nitric acid; with carbon, carbonic acid, &c. Respiration, combustion and fermentation are the three principal operations producing the combinations of oxygen and carbon; the results, carbonic acid.

Acids combine readily with metals, earths and alkalies—as iron, lime and potash. By chemists these combinations are called salts, designated by the termination *ate*. Sulphuric acid, combining with various bases, produces sulphates; nitric, nitrates; carbonic, carbonates. Sulphate of lime is gypsum or plaster of Paris; sulphate of iron, copperas; of soda, glauber salts; of magnesia, epsom salts. The carbonate of lime is common limestone, marbles, chalk, and many beautiful crystals. Carbonates of iron, copper, and lead, are ores of those metals.

About a century ago water was found to be composed of oxygen and hydrogen, and common air of oxygen and nitrogen. About half a century since oxygen was found by Sir Humphrey Davy to be an element of rocks, of course of soils, as it was of the alkalies, potash, and soda. The other elements in earths and alkalies, combined with oxygen, were found by the same great chemist, to be metals very peculiar in character.

It hence appears that oxygen is an element in air, earth and water, existing abundantly in solid, liquid and aerial forms. In the whole, it constitutes nearly half our globe. It is, of course, the most abundant element in the material world. It is also the most important agent in producing changes in matter essential to human existence. It is very appropriately called *vital air*, as neither animal life nor any life can exist without it. It is no less essential to combustion than to life. It also acts with great energy upon metals and other solid substances. In this action it produces three very large and very important classes of bodies—oxydes, acids and salts. Iron rust is the oxyde of iron; the dross of lead, oxyde of lead; burnt lime, the oxyde of calcium; pure potash, the oxyde of potassium; pure soda, the oxyde of sodium; silex or flint, the oxyde of silicium. The combination of one part oxygen and four of nitrogen constitutes the atmosphere; three parts oxygen and one nitrogen form nitric acid, aquafortis. Combined with other substances, it forms numerous acids. Saltpetre is the nitrate of potash. The large

quantity of oxygen it receives from the nitric acid fits it for a material in gunpowder—giving to that powerful agent its principal power.

A plate, tumbler and scrap of paper, with a little water, will enable any teacher or parent to perform an experiment on oxygen equally simple, instructive and interesting. In a deep plate pour some water. On the water place a scrap of thick paper, piece of cork, or other light substance; on that another piece of paper or cotton moistened with oil. On lighting the paper or cotton, place over it a large empty tumbler. The combustion continues for a few seconds, and when it is extinguished the water occupies about one fifth of the space in the tumbler, showing the necessity of oxygen for combustion, and that it constitutes about one-fifth the air we breathe. What man, woman, or child would not like to be familiarly acquainted with an element so abundant and an agent so active as oxygen, especially when such an acquaintance is equally simple, useful and delightful?

ANSWERS TO INQUIRIES.

BEST KINDS OF CORN FOR GARDEN CULTIVATION.—T. S. The best early variety for "green corn," or "roasting ears," is the Early White Flint, or Canada White Flint. It is an eight-rowed kind, with small stalk, and quite productive in ears. It has been known to reach the state fit for boiling in eight weeks from the time of planting. The "Darling Sweet Corn," (originated by the late Judge DARLING, of New-Haven,) is nearly as early as the above, but is not as prolific. The best variety for the latter part of the season is the "Large Sweet." It has usually ten rows to an ear, ears nine to ten inches long. It is the kind grown by the Shakers for drying for winter use.

CLOVER HAY.—C. H., Cayuga county. If clover has been cut at the right time, or while most of it is in blossom, and rightly made—that is, preserved with its heads and leaves on the stalk, free from mustiness—it is worth as much per pound or ton, as any other hay. It is better than timothy for fattening stock, milch cows or sheep. It is more bulky in proportion to its weight than most other kinds of hay, and hence the mistake frequently made in regard to its being of less value. The objection that it is liable to waste more than other kinds in feeding, will not apply to that which is passed through a cutter. If it is cut, none need be wasted, if the mangers or feeding troughs are of the right kind.

WHAT TIME SHOULD EWES YEAN?—B. N., New-York. The period of pregnancy in the sheep is five months. For flocks which are kept chiefly for wool, it is generally preferred to have the lambs dropped about the time the grass starts, so as to afford sheep a "good bite." The advantage of this is, that grass causes the ewes to give a supply of milk for the lambs, (which Merino sheep will not have without grass, unless great attention is paid to their feeding,) and the lambs are reared with more certainty and less trouble. Where lambs are designed for the butcher, it is best to have them dropped as early as March; and by feeding the ewes with good hay and plenty of succulent food—as carrots, turneps, &c., the lambs will grow rapidly.

RYE-GRASS.—C. T. B. This variety of grass is better for pasturage than for hay. It starts very early, and is ripe before most varieties are in a sufficiently mature state to cut. It is good for sheep-pastures, both from

its earliness, and from its being well relished by sheep. The kind called Pacey's rye-grass, is generally preferred. Half a bushel of good seed is generally sown to the acre. It is not a good grass for lawns, as it grows too much in bunches or stools, which make the surface uneven.

COMPOST OF MUCK.—W. S. We should prefer ashes to lime to mix with muck. Lime does not as readily neutralize the acid of the muck, and the compost is more soluble from the use of potash.

INDIA-RUBBER MILKER.—We have never seen the article tried. It is for sale by JAS. McMULLEN, of this city, at \$2.50 per set.

PINE APPLE CHEESE.—H. M. M., St. Charles county, Md. We will give an article on this in our next.

NEW PUBLICATIONS.

YOUATT ON THE STRUCTURE AND DISEASES OF THE HORSE, with their remedies; also practical Rules to Buyers, Breeders, Breakers, Smiths, &c.; being the most important parts of the English edition of "Youatt on the Horse," somewhat simplified: Brought down to 1849, by W. C. SPOONER: To which is prefixed an account of the breeds in the United States, compiled by HENRY S. RANDALL; with numerous illustrations. DERBY & MILLER, Auburn, N. Y.

This is a work of nearly 500 pages duodecimo. It is handsomely "got up," and embodies a large portion of the valuable matter contained in the English works referred to in the title. We shall take occasion to notice it more particularly hereafter.

HARPER'S NEW MONTHLY MAGAZINE.—The December number of this work is the commencement of the second volume—two volumes being given in a year. The publishers have introduced a new feature—that of giving "occasionally some of the master-pieces of classical English literature, illustrated in a style of unequalled elegance and beauty." The December number contains GOLDSMITH'S *Deserted Village*, with beautiful engravings, and much other interesting reading.

WATER CURE JOURNAL AND HERALD OF REFORMS.—This monthly publication, it will be seen by an advertisement in this number, has been greatly enlarged and improved. It is beautifully printed, on paper of very superior quality, and altogether presents an appearance not excelled by any work with which we are acquainted. Its reading matter is of an interesting character. Published by FOWLERS & WELLS, New-York.

THE HORTICULTURIST, AND JOURNAL OF RURAL ART AND RURAL TASTE. This magazine has been published four and a half years, and its influence in reference to the objects to which it is devoted, is strikingly shown in the rapid progress of improvement in various parts of the country. It is a work which is alike useful to the amateur, and commercial gardener and horticulturist, and is, indeed, indispensable to all who would keep up with the march of knowledge on these subjects. The editor, Mr. DOWNING, is known both in this country and Europe, as one of the ablest writers of the age, on all branches of horticulture, landscape gardening, rural architecture, &c.; and its correspondents include many of the most intelligent cultivators of the country. This work is issued on the first of each month, in the best style of the periodical press; each number containing 48 pages,

embellished with a frontispiece, and several other engravings. A new volume commences with the present month, (January.) Terms—three dollars a year—two copies for five dollars, payable in advance. Business letters should be addressed to the Proprietor, LUTHER TUCKER, Albany, N. Y.; and communications to A. J. DOWNING, Newburgh, N. Y.

THE FARMER'S GUIDE TO SCIENTIFIC AND PRACTICAL AGRICULTURE. This is an elaborate and most valuable work by HENRY STEPHENS, author of the *Book of the Farm*, with notes by Prof. J. P. NORTON, of Yale College, designed to adapt the work to the United States. It is published by LEONARD SCOTT & Co., 79 Fulton-st., New-York. It is issued in numbers, at 25 cents each, or \$5.00 in advance for the work, which will be completed in 22 numbers, 13 of which are already issued. It will form one of the best and most comprehensive treatises on agriculture that has ever been published.

BRITISH AND FOREIGN MEDICO-CHIRURGICAL REVIEW; or Quarterly Journal of Practical Medicine and Surgery. This valuable publication, which should be in the hands of every medical practitioner, is republished by Messrs. R. & G. S. Wood, 261 Pearl-street, New-York, at three dollars a year.

New-York State Agricultural Society.

Annual Meeting.

THE *Annual Meeting of the Society* will be held at the Capitol, on the 3d Wednesday, 15th of January. Premiums will be awarded on *Farms, Essays, Dairies, Butter, Cheese, and Farm products generally*; and an exhibition of Fruits will be held at the Society's Rooms.

It is desired that there should be an extensive competition for the premiums offered by the Society; and a full representation of farmers from every county in the State.

Persons sending fruits are requested to have the varieties properly labelled and named, with the name and residence of the exhibitor; securely packed and directed to the Agricultural Rooms, and forwarded as early as practicable. It is desirable that the character of the soil, the exposure of the orchard, and its management, and the habits of the tree, as to its thrift and bearing character, be given.

The following committees have been appointed for the Winter Meeting:—

Management of Farms.—A. Van Bergen, Coxsackie; Hamilton Murray, Oswego; James Kelly, Rhinebeck.

Essays, Draining, and Agricultural Work for Schools.—John Delafield, George Geddes, and J. P. Beekman.

Butter and Cheese Dairies.—B. P. Johnson, S. A. Law, Meredith; George Brayton, Oneida.

Butter and Cheese on Exhibition.—Henry Wager, Oneida; Phineas Rumsey, Orange; J. W. Ball, Otsego.

Fruit.—Herman Wendell, M. D., Albany; Hon. Samuel Miller, Rochester; R. L. Pell, Pe ham; Hon. Theron G. Yeomans, Walworth; Charles Lee, Penn Yan; Mr. Tibbits, White Plains.

Wheat, Rye and Oats.—J. B. Burnet, Onondaga; D. S. Curtis, Canaan; Hon. Lorenzo Rouse, Oneida.

Indian Corn.—Boswell M. Reed, Coxsackie; Hon. Orlando Allen, Erie; Lewis E. Smith, Half-Moon; Mr. Beers, Somers.

Barley, Buckwheat, Peas and Beans.—Benjamin Enos, Madison; Stephen Haight, Dutchess; Thomas Bell, Westchester.

Potatoes and Root Crops.—James M. Ellis, Onondaga; E. N. Pratt, Greenbush; Henry Miller, Hudson.

Madder, Corn Fodder, Flax, Hops, Tobacco, Broomecorn.—Hon. James Farr, Washington; James Macintyre, Fonda; A. Osborne, Watervliet.

Pomological Exhibition.—J. McD. McIntyre, J. J. Viele, Sanford Howard, B. B. Kirtland, James Wilson.

Treasurer's Account.—Lewis G. Morris, and President and Secretary, and Corresponding Secretary.

Committee to Arrange for Winter Meetings.—E. P. Prentice, Luther Tucker, B. P. Johnson.

Agricultural Survey of Seneca.—J. P. Beekman, George Vail, Z. C. Platt.

DOMESTIC ECONOMY.

Method of Curing Prize Hams.

The hams of Maryland and Virginia have long enjoyed a wide celebrity. At the last exhibition of the Maryland State Agricultural Society, four premiums were awarded for hams. We are informed by those who had the opportunity of examining them, that they were of first rate quality. The following are the receipts by which the hams were cured:

T. E. HAMBLETON'S RECIPE—1st premium. To every 100 lbs. pork, take 8 lbs of G. A. salt, 2 oz. saltpetre, 2 lbs. brown sugar, 1½ oz. of potash and 4 gallons of water. Mix the above, and pour the brine over the meat, after it has laid in the tub some two days. Let the hams remain six weeks in brine, and then dried several days before smoking. I have generally had the meat rubbed with fine salt when it is packed down. The meat should be perfectly cool before packing.

J. GLENN'S RECIPE—2nd premium. To 1000 lbs. of pork, take half a bushel and half a peck of salt, 3 lbs. saltpetre, 3 lbs. sugar, and 2 quarts of molasses. Mix—rub the bacon with it well; keep on for three weeks in all, but at the end of nine days take out the hams, and put those which were at the top, at the bottom.

R. BROOKE JR.'S RECIPE—3d premium. One bushel fine salt, half bushel ground alum salt, one and a half pounds saltpetre to the thousand lbs. pork, left to lie in pickle 4 weeks, hung up and smoked with hickory wood until the rind becomes a dark brown.

C. D. SLINGLUFF'S RECIPE—4th premium. To 100 lbs. Green Hams, take 8 lbs. G. A. salt, 2 lbs. brown sugar or molasses equivalent, 2 oz. saltpetre, 2 oz. pearl ashes, 4 gallons water, dissolve well, skimming off the scum arising on the surface. Pack the hams compactly in a tight vessel or cask, rubbing the fleshy part with fine salt—in a day or two pour the above pickle over the meat, taking care to keep it covered with the pickle. In four to six weeks, according to the size and weight of the hams, (that is to say, the longer period for heavy hams,) hang up to smoke, hock up; smoking with green hickory wood. I have put up hams for the last 12 or 15 years by the above recipe with uniform success, equal at all times to the sample now presented.

To the above we add the following, which we, as well as many others, have satisfactorily proved:

For every one hundred pounds of meat, take five pints of good molasses, (or five pounds of brown sugar,) five ounces saltpetre, and eight pounds rock salt—add three gallons of water, and boil the ingredients over a gentle fire, skimming off the froth or scum as it rises. Continue the boiling till the salt, &c. is dissolved. Have the hams nicely cut and trimmed, packed in casks with the shank end down, as the pickle will thus strike in better. When the pickle, prepared as above, is cooled to blood heat, pour it over the hams. They may lie in pickle from two to six weeks, according to the size of the pieces, or the state of the weather, more time being required in cold, than in warm weather. Beef or mutton hams, intended for smoking and drying, may be cured according to this mode, and will be found excellent.

Much of the goodness of hams depends on smoking. They should be hung at such a distance from the fire, as not to be heated. They should also be hung up with the shank end downward, as this will prevent the escape of their juices by dripping. Small hams, wanted for immediate use, will answer with two weeks' smoking, but larger ones, and those wanted for keeping, should be smoked four weeks or more.

FRIED POTATOES.—The French method of cooking potatoes affords a most agreeable dish. The potatoes are peeled, wiped, and cut into thin slices, then thrown into a frying pan containing an abundance of hot lard. As soon as they become brown and crispy they are thrown into a collander to drain, then sprinkled with salt, and served up as hot as possible.

NOTES FOR THE MONTH.

ACKNOWLEDGEMENTS.—We have received communications since our last, from R. Grant, W. L. Owen, L. L. Bullock, John Johnston, J. S. P., A. K., D. T., J. W. Lincoln, J. H. Salisbury, H. M. Mattison, J. French, H. M. M., J. W. Proctor, P. P. P.

BOOKS, PAMPHLETS, &c. have been received, during the last month as follows:—Catalogue of Officers and Students of Yale College, for 1850-51, from Prof. NORTON.—The American Journal of Science and Arts, for Nov., from the EDITORS, New Haven, Conn.—Report of the 5th exhibition of the Delaware county (Pa.) Institute of Science, with the address of J. M. BROOMALL, Esq.—Youatt on the Horse, with notes by W. C. Spooner and H. S. Randall, from the publishers, DERBY & MILLER, Auburn.—Proceedings of the Philadelphia Society for promoting Agriculture for 1850.

"ONE WHO INTENDS TO BE A FARMER."—Your plan of farm-buildings is very creditable to a young architect, but is lacking in some points which convenience and economy require. For instance, there is no provision for the storage of grain, though there is a threshing-floor; the apartments for the storage of hay and straw for the different kinds of stock, are much too small, and their situation requires too much labor to carry the fodder to the stock.

PHOSPHATE OF LIME.—We learn from Dr. E. EMMONS that an inexhaustible supply of this article has been discovered on the west shore of Lake Champlain, at Crown Point. A considerable quantity of it was quarried last autumn, some of which has been examined by Dr. E., and also by Prof. NORTON, and has been found to contain from four to five per cent of phosphate. It may be prepared for use as manure, either by being ground in a mill, after the manner of grinding plaster, or it may be burnt, like lime. It is harder than plaster, and would require more force in pulverizing. When burnt, it readily falls to powder.

It will be recollected that the use of phosphate of lime has been attended with highly favorable results in some parts of Europe, particularly on old pasture grounds, and such as have been much devoted to grain crops, which have been exhausted of their phosphates. We trust that accurate trials of this article will be made the coming season, in comparison with bones and other manures, for various crops and on various soils, and that the results will be given to the public. Farmers will then have some criterion by which they may determine its relative value, and the expediency of purchasing it as a manure.

DRAINAGE OF SOILS.—So far as we can learn, the results of under-draining in this country have given great satisfaction. Mr. JOHN JOHNSTON, of Seneca county, who may be considered the pioneer in this enterprise in western New-York, informs us that he laid down about 5,000 tiles the past autumn, making, with what where before laid, over 50,000 on his farm. The tile-machine owned by Mr. WHARTENBURY, of Waterloo, has been in constant operation, and does not supply the

demand for tiles. Mr. JOHNSTON suggests to the makers of wire fence, that a good drain, two and a half or three feet deep on the upper side of the fence, (or if the ground is not sloping as near the fence as practicable,) will keep the posts from heaving by frost. If the ground is wet, he says the posts will heave, even if set "six feet deep."

STANDARD FOR THE SHAPE OF FOWLS.—At the late exhibition of poultry at Boston, a well known gentleman, who had carefully examined the different kinds of fowls, observed: These long-legged, thin-breasted chickens will never answer for the table. I speak from forty years' practice in *carving*. I have formerly had them, sometimes, on my table, but have grown wise by experience, and will have no more of them. To say nothing of the poor quality of their flesh, their shape is not right. For instance, if I have a pair of such chickens, and there are half a dozen ladies at table, each chooses a piece of the breast, and there cannot be enough cut from that part to serve round; but if I have a pair of partridges [ruffed grouse,] though they may not weigh more than half as much as the chickens, I can readily take a slice from the breast for each guest. The partridge, then, should be the standard for the shape of fowls; and besides the advantage alluded to, it will be found in general, that the nearer this form is approached, the better will be the flesh, and the greater the quantity in proportion to the bone.

MR. BELL'S SALE OF STOCK.—We would call particular attention to Mr. BELL's sale of stock, a list of which will be found in our advertising department. He has taken great pains, both in the original selection of his animals, and in the breeding of those he has reared. We saw his whole herd last fall, and can safely say, that one hundred cows of equal value for the dairy, are very rarely collected. Many of the "grades" are animals of much value, combining symmetry, constitution and thriftiness, with excellent dairy properties.

SALE OF SHORT-HORNS.—We learn that GEO. VAIL, Esq., of Troy, has recently sold the short-horn bull-calf and two year old heifer which obtained the first premiums at the last show of the American Institute. The calf, *Kirkleavington*, was by *Wellington*, out of *Lady Barrington* 3d, both purchased by Mr. V. of the late THOS. BATES, Esq., of Yorkshire, England. The purchaser of the two animals first mentioned, is Mr. ELISHA W. SHELDON, of Sennett, Cayuga county, N. Y. We hope his liberal enterprise will be properly rewarded.

"CHAPPEL'S FERTILIZER."—We have noticed frequent advertisements at the south, of an article under this name, but have seldom seen any particulars in regard to its effects. Mr. EDWIN G. BOOTH, states in the *Southern Planter*, that "he has tried it in every conceivable manner, and," he continues, "if one particle of benefit has ever been imparted to the land or the crop, I have been unable to perceive it, nor has any other person who has seen it been more fortunate." Mr. B. then goes on to give an account of an experiment made on the farm of RICHARD IRBY. "He laid off two contiguous squares on unproductive land,

and put on one the quantity of Chappel's fertilizer recommended; on the other, the usual quantity of guano was sown. That on which the fertilizer was applied remained unproductive; the other produced a good crop. The line of demarkation being as striking as shade and sunshine."

ANALYSES OF SOILS, MANURES, &c.—From the frequent inquiries which have been made, in regard to procuring reliable analyses of various substances, the officers of the New-York State Agricultural Society, have been induced to make an arrangement with Dr. J. H. SALISBURY, by which investigations may be obtained in the various branches of agriculture which practical chemistry is capable of illustrating. The charges for analysis are as follows:

Complete quantitative inorganic analysis of a soil, limrock, gypsum, peat, marl, animal manure,.....	\$5 00
Complete proximate organic analysis of a manure, marl, peat, soil,.....	5 00
Determination of the per centage of water, dry matter, and ash in manures, &c.....	2 00
Analysis of mineral or spring waters,.....	7 00

The above fees to accompany all samples or communications. No analysis will be allowed to pass out of the Laboratory till paid for.

The analysis of ores, minerals, rocks, commercial articles, &c., also attended to with care.

For analysis, enough of the above substances should be sent to make half a pound when dry. Of mineral or spring waters, about one gallon is required.

Samples and communications may be forwarded, post paid to Dr. J. H. SALISBURY, or to B. P. JOHNSON, Esq., Secretary N. Y. State Ag. Soc., old State Hall, Albany.

STANLEY AND DICKERMAN'S INDIAN PORTRAIT GALLERY.—Having had the pleasure of examining this splendid collection of Indian portraits, while it was being exhibited in this city, we feel that by calling attention to it, we may perform a public service. It consists of upwards of one hundred figures, sketched from life by Mr. STANLEY, during a sojourn of several years among the various Indian tribes between the Mississippi river and the Pacific ocean. They represent almost every phase of Indian character, from the wild and superstitious Pawnee-Pict, to the civilized and intelligent Cherokee. We have good reason to believe that these figures are *likenesses*, and they are, besides, declared by connoisseurs to possess much artistic merit. Great credit is due to Messrs. S. and D., for the unwearied pains they have taken in producing this collection. The Indian, as he was by nature, is rapidly passing away, and in a short time he will be seen only as changed, more or less, by intercourse with the race by whom he has been supplanted, and before whom he seems destined to yield the last foot of that vast territory over which he once roamed.

MULTICOLE RYE.—E. G. BOOTH, states in the *South-ern Planter* that he has tried this variety of rye in comparison with other varieties, on several kinds of soil, and in all cases the Multicole was superior in yield—on some rather poor soils, it yielded twice as much as any other.

BONES AS MANURE.—The use of bones as manure was commenced in England, about 1776. It was then common to apply from 60 to 70 and even 100 bushels to the acre—they being coarsely broken by hammers. Experience has proved, however, that so large a quantity does not produce effects in proportion, and 10 to 12 bushels are now thought to be sufficient in most cases.

The annual value of bones used in England for manure, is estimated at £880,000 or \$4,400,000.

WORLD'S EXHIBITION FOR 1851.—We learn from the English papers that the arrangements for this great exhibition are progressing rapidly. The stupendous building, destined to receive the numerous articles which will be sent from all parts of the globe, will probably be completed by the appointed time.

The exhibition is to be opened in Hyde Park, London, on the first day of May, 1851. Goods will be received between the first of January and the first of March,—after the latter day, none will be received. The building is to be 1,848 feet long, 408 feet wide, and 88 high, with a machinery room 936 feet long and 48 feet wide. It is to be chiefly of cast-iron and plate-glass; 4,000 tons of the latter material will be required for the roof. An avenue, 72 feet in width, extends lengthwise through the center of the building. Along the sides of this avenue, at distances of 24 feet, are placed columns, for the support of the roof. Girders of iron are inserted into the sides of the building and the columns, 18 feet from the floor. These girders are two feet in depth, and 2,244 of them will be required. The strength of these girders, and of every piece of iron used in the building, is tested by a powerful hydraulic press. A transept crosses the main building near its center. The transept is to have a circular roof, which is to rise 20 feet above the other part of the building, and cover a row of six very large elm trees, around which it is intended to provide a first-class refreshment room. The length of the transept, including the space to be set apart for refreshment rooms, will be 408 feet, its width 72 feet, and the height from the floor to the center of the circular roof will be 108 feet.

TO PREVENT THE ATTACK OF THE "ONION GRUB."—The growth of the onion is frequently prevented and the plant sometimes destroyed by a worm which attacks it as soon as it appears above ground. A correspondent of the *Gardener's Chronicle* states that he has applied nitrate of soda with good effects in preventing the ravages of this insect. He used half a pound of the salt to a gallon of water, and applied eight gallons to a bed of ten yards in length. He states that it checked the progress of the worms, and the crop turned out well.

AVERAGE PRODUCTS OF AN ENGLISH FARM.—The following are the averages of some of the products of a farm of 740 acres, near Brighton, England, occupied by WM. RIGDEN. He has 250 acres of wheat, averaging 26 bushels per acre; 40 of barley, 40 bushels; 60 in oats. 60 to 80 bushels; 240 acres in clover and grasses, two tons hay. He keeps 350 South Down ewes, which average yearly about 400 lambs; average quantity of wool yielded by the flock, four pounds per fleece, and it sells at 25 cents per lb. He keeps 21 cows, which yield on an average ten quarts of milk per day, the year round.

HEIGHT OF LIGHTNING RODS.—It has been laid down as a rule, derived from experiments made in France, on the conducting power of lightning-rods, that a rod will protect a circle whose radius is equal to twice the height of the rod. Prof. LOOMIS, of New-Haven, states that

he has heard of a case where a pile of shavings were set on fire by lightning, at the distance of one hundred feet from a lightning rod of fifty-nine feet in height. From this case Prof. L. concludes that it is unsafe to rely upon a rod to protect a circle whose radius is more than once and a half the height of the rod.

RELATIVE WEIGHT OF CORN AND COB.—The proportion of corn to the cob, in different varieties, is a matter of great importance, and should be duly regarded in selecting a kind for cultivation. The same point should be aimed at in this case as in animals for fattening—the least proportion of offal to the valuable parts. E. M. BRADLEY gives the *Rural New-Yorker* the results of an experiment on this subject. The varieties of corn were the Dutton. (yellow twelve-rowed,) the Vermont, (yellow-eight-rowed,) and the Red-blaze, (white eight-rowed.) Samples of each of these kinds were husked the first week in October, thoroughly dried; then carefully weighed and shelled, showing the following results:—

75 lbs. of ears of Dutton gave of cobs 20 lbs. 9 ozs., of corn 54 lbs. 7 ozs.

75 lbs. of ears of Vermont corn gave of cobs 15 lbs. 12 ozs., of corn 59 lbs. 4 ozs.

75 lbs. of ears of Red-blaze gave of cobs 15 lbs. 11 ozs., of corn 59 lbs. 5 ozs.

The corn was measured before it was shelled. Of the Dutton there was two bushels and four quarts; of the Vermont two bushels, and of the Red-blaze two bushels and two quarts. Thus the two latter varieties yielded 8½ per cent more corn in proportion to the weight of cob than the Dutton, and considerably more in proportion to the bulk. There is another disadvantage connected with large cobs, which should be noticed. They are much longer in drying, and consequently the grain is much more likely to mould and spoil, either in the crib, or while it is in shock.

WM. M. PLANT.] ST. LOUIS [WM. SALISBURY.
Agricultural Warehouse and Seed Store,
Corner of Fourth and Green Streets,
(Lately Plant & Brother.)

By PLANT & SALISBURY, Wholesale and Retail Dealers in
GARDEN, GRASS, FLOWER, AND OTHER SEEDS.
CLOVER, Timothy, Red Top, Blue Grass, Millet, Randall Grass,
Orchard Grass, Hemp, Mustard, Locust, Osage Orange, Canary,
&c., &c. Best market rates paid in cash for the above Seeds.

Implements and Machines.

Plows, Harrows, Seed Sowers, Hay Cutters, Corn Shellers, Shovels, Spades, Hoes, Rakes, Haying Tools, Horse Rakes, Budding and Pruning Knives, Saws and Chisels, &c., &c.

Agricultural Books—A Large Stock.

Also, Fruit and Shade Trees, Green-house and Garden Plants, &c., all of which we will sell as low as any other house in the city. A Descriptive Catalogue furnished to post-paid applicants. Orders solicited and promptly executed by PLANT & SALISBURY.
St. Louis, Jan. 1, 1851—1t.

Prouty & Mear's Celebrated Premium Center Draught Plows.

A LARGE assortment can be found at the State Agricultural Warehouse, No. 25 Cliff-street, New-York.
Jan. 1—1t. BARR & ATTERBURY.

Mount Rutzen Fruit and Ornamental Trees.

THE subscribers have for sale all the choice varieties of the Pear, Apple, Plum, Cherry, Peach, Apricot, Nectarine, Quince, Red Antwerp and Franconia Raspberries, Gooseberries, Currants, and Strawberries.

Also, a good assortment of Dwarf Pear Trees. None cultivated but those that have been tested in this country. When purchasers desire, selections will be made by the proprietors, so as to afford a regular succession of the best varieties through the season, and all warranted true to their names.

Trees for canal and railroad well packed in bundles, inclosed in mats, put up in moss.

All communications, post-paid, to be directed *Rhinebeck, Dutchess Co., N. Y.*
GEORGE SNYDER & Co.

Jan. 1, 1851—1t.*

BUSINESS NOTICES.

To our Subscribers.

With this number we send you, agreeably to our promise, a copy of

The Pictorial Cultivator Almanac,

which has been got up at a heavy expense, expressly as a NEW YEAR'S PRESENT to the subscribers of THE CULTIVATOR. If, in return, all who receive this number will use their influence to increase the list of our subscribers for the present year, they will confer a favor for which they will receive our hearty thanks.

Every Subscriber an Agent.

All our Subscribers, as well as all Postmasters, are especially invited to act as Agents for our publications, THE CULTIVATOR and THE HORTICULTURIST.

Agents who compete for our Premiums, will aid us in keeping their accounts, if they will number their subscribers, 1, 2, 3, and upwards.

Remember the Terms to Clubs.

Seven Copies for \$5.00—Fifteen Copies, and a Dollar Book to the Agent, for \$10.00.

In answer to several inquiries, we would state, that it is not required that all papers in a club should be sent to one post office. We will address them to as many different offices as may be necessary.

Premiums to Agents of the Cultivator.

As an inducement to greater exertion on the part of those disposed to act as Agents, the following PREMIUMS will be paid, in Books, or Implements or Seeds, from the Albany Agricultural Warehouse, to those who send us the largest number of subscribers for 1851:

1. To the one who shall send us the greatest number of subscribers to THE CULTIVATOR for 1851, with the pay in advance, at the club price of sixty-seven cents each, previous to the 20th of March next, the sum of FIFTY DOLLARS.
 2. To the one sending us the next largest number, the sum of FORTY DOLLARS.
 3. To the one sending us the next largest number, the sum of THIRTY DOLLARS.
 4. For the next largest list, the sum of TWENTY DOLLARS.
 5. For the next largest list, TEN DOLLARS.
 6. For the FIVE next largest lists, each FIVE DOLLARS.
 7. For the TEN next largest lists, each THREE DOLLARS.
 8. A copy of Thomas' "AMERICAN FRUIT CULTURIST," price one dollar—a very valuable work—or any other dollar book—to every Agent who sends us fifteen subscribers and \$10, and who does not obtain one of the above prizes.
- ALBANY, N. Y., Jan. 1, 1851
LUTHER TUCKER.

THE HORTICULTURIST,

AND

Journal of Rural Art and Rural Taste.

EDITED BY A. J. DOWNING,

Author of "Landscape Gardening," "Designs for Cottage Residences," "Fruits and Fruit Trees of America," &c., &c.

To all persons alive to the improvement of their gardens, orchards, or country seats,—to scientific and practical cultivators of the soil,—to nurserymen and commercial gardeners, this Journal, giving the latest discoveries and improvements, experiments and acquisitions in Horticulture, and those branches of knowledge connected with it, will be found invaluable. Its extended and valuable correspondence presents the experience of the most intelligent cultivators in America; and the instructive and agreeable articles from the pen of the Editor, make it equally sought after by even the general reader, interested in country life. The "FOREIGN NOTICES" present a summary from all the leading Horticultural Journals of Europe; the "DOMESTIC NOTICES," and "ANSWERS TO CORRESPONDENTS," furnish copious hints to the novice in practical culture; and the numerous and beautiful Illustrations,—Plans for Cottages, Greenhouses, the Figures of New Fruits, Shrubs and Plants, combine to render this one of the cheapest and most valuable works on either side of the Atlantic.

A NEW VOLUME, (the 6th,) is commenced with the January number, 1851, with some important improvements in the mechanical appearance of the work; and no efforts will be spared by the editor or publisher, to render it still more worthy of the liberal patronage extended to it.

TERMS—Three Dollars per year—Two copies for Five Dollars. All payments to be made in advance, and orders to be post-paid.

All Agents for THE CULTIVATOR, and Postmasters generally, are invited to act as Agents for THE HORTICULTURIST.

LUTHER TUCKER,
Publisher, Cultivator Office, Albany, N. Y.

State Agricultural Warehouse.

THE subscribers would respectfully invite the attention of Farmers and Planters to their varied assortment of

Agricultural and Horticultural Implements,

among which may be found Prouty & Mear's celebrated and highly approved Center Draught Plows; Emery & Co.'s Improved Rail Road Horse-power and Thresher, (all of which took the first premiums at the late State Agricultural Fair, and are unequaled by any now in use;) together with a full assortment of the latest and most improved Plows, Straw Cutters, Fanning Mills, Corn Shellers, Seed Sowers, Cultivators, Harrows, &c., &c., which they will sell at as low rates as any similar establishment in the United States.

We shall at all times have on hand a full stock of Field and Garden Seeds, Guano, and all other Fertilizers in the market, which may be had on the most reasonable terms.

Persons purchasing articles of us may rely upon their giving satisfaction, as we intend keeping only such as we can fully warrant.

BARR & ATTERBURY,
No. 25 Cliff-street, New-York.

Jan. 1—1t.

Prospectus of the Water-Cure Journal, for 1851.

THE WATER-CURE JOURNAL is published monthly, illustrated with engravings, exhibiting the Structure, Anatomy and Physiology of the Human Body, with familiar instruction to learners. It is emphatically a JOURNAL OF HEALTH, adapted to all classes, and is designed to be a complete FAMILY GUIDE, in all cases and in all diseases.

HYDROPATHY,

Will be fully unfolded, and so explained that all may apply it in various diseases, even those not curable by any other means. There is no system so simple, harmless, and universally applicable as the Water Cure. Its effects are almost miraculous, and it has already been the means of saving the lives of thousands, who were entirely beyond the reach of all other known remedies.

PHILOSOPHY OF HEALTH.

This will be fully discussed, including Food, Drinks, Clothing, Air, and Exercise, showing their effects on both body and mind.

REFORMS

In all our modes of life will be pointed out, and made so plain that "he that runs may read." We believe fully that man may prolong his life much beyond the number of years usually attained. We propose to show how.

TO INVALIDS,

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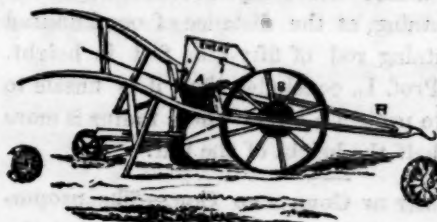
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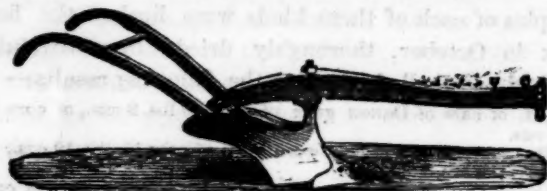


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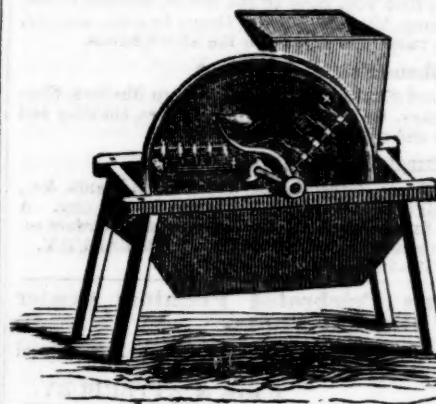
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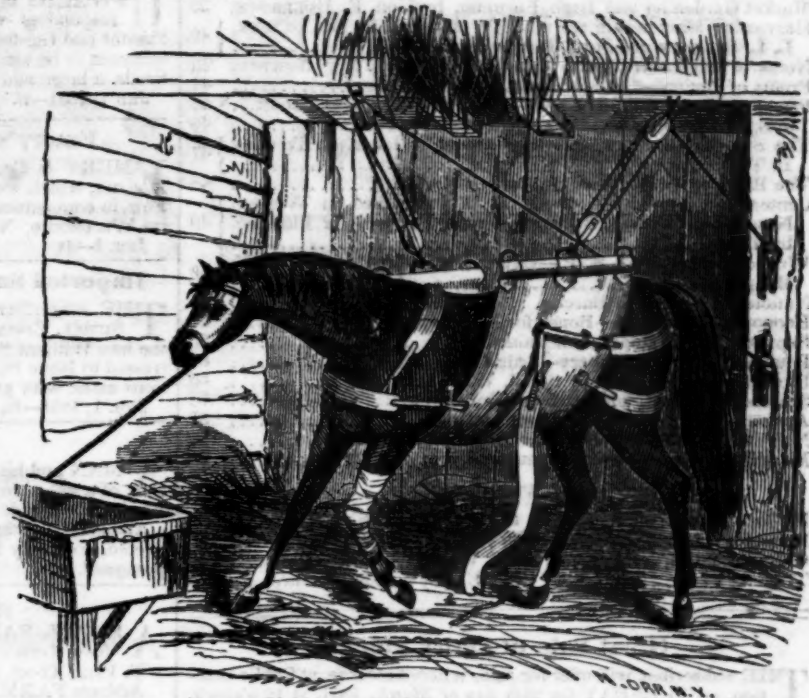
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Oct 1—7t.

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Jan. 1, 1851—4t.

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THE Transactions of the New-York State Agricultural Society, vols. 1 to 9, for sale at the Office of "THE CULTIVATOR"—price \$1 per vol.

Contents of this Number.

Improvement in Agricultural Implements,	33
Market Gardening and High Farming, by Hon. F. HOLBROOK,	35
Harvesting Machines in use at the West, by C. H. McCORMICK,	40
L. L. BULLOCK and JOHN JOHNSTON,	43
Notes of a Tour in Central New-York, by Prof. J. P. NORTON,	43
Profits of Poultry—Crops in Nova Scotia,	44
Protection from Winter Winds—The Seventeen-year Locust,	45
Transplanting Shrubs—Answers to Inquiries,	46
The Spanish Chestnut, and Experiment with a Plum Tree, by	47
D. T.—Sharp Frosts in Valleys, &c.,	48
The Black-faced Sheep of Scotland,	48
Center-draft Plow, No. 40—First Wheat raised in Western	49
New-York, by S. B. BUCKLEY—Small Potatoes for Planting,	49
by T. S. GOLD,	49
Wool and Gum, by J. S. P.—Devon Breed of Cattle, by J. N.	50
BLAKESLEE,	51
National Agricultural Bureau,	51
Economy of Manures—Bones for Manure, by W. A. ELA,	52
Supposed Transmutation Explained,	53
Poultry House and Grapery—Large Yield of Hay,	54
Remarks on Irrigation, by Col. J. W. LINCOLN,	55
Studies in Natural Science, by J. HOLBROOK,	56
Answers to Inquiries—New Publications,	57
N. Y. S. Ag. Society—Domestic Economy,	58
Monthly Notices—To Correspondents, &c.,	59

ILLUSTRATIONS.

McCormick's Reaper,	41	Black-faced Sheep,	48
Hussey's Reaper,	42	Center-draft Plow, No. 40,	49
Group of Trees,	45	Wheat and Chess,	53
Training Pears,	47	Emery's Sede Planter,	62

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